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ABSTRACT

A brief review of the findings of previously funded early childhood research is followed by a complete description and analysis of the longitudinal descriptive studies and longitudinal studies of intervention reported in FY 70 and 71 by the members of the Interagency Panel on Early Childhood Research and Development. The longitudinal descriptive studies are divided into those dealing primarily with Normal and Abnormal Physical and Psychological Development, and Cognitive and Socioemotional Development. Intervention studies are divided into two categories: Physical and Psychological Treatment and Early Educational Intervention. On the basis of these studies, an attempt is made to identify the major areas and populations needing further long term research. (CS)

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A Preliminary Report

on

THE PRESENT STATUS AND FUTURE NEEDS IN LONGITUDINAL STUDIES IN EARLY CHILDHOOD RESEARCH AND DEVELOPMENT

Prepared for

The Interagency Panel on

Early Childhood Research and Development

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by

Joyce B. Lazar, M.A.

Social Research Group
The George Washington University
Washington, D.C.

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PREFACE AND ACKNOWLEDGEMENTS

The primary purpose of this review is to point out gaps and needs in currently funded longitudinal studies supported by member agencies of the Interagency Panel on Early Childhood Research and Development. As the review of studies funded during the last two fiscal years proceeded, it became apparent that it would be difficult to identify gaps and needs without also reviewing the findings of previously funded research, including basic and applied studies, evaluations and cross-sectional research as well as other longitudinal studies. To do so would have required a "state of the arts" paper on each research area. Consequently the scope of this paper is, as thorough as possible, but by no means as thorough as desirable. Thus the gaps identified, and the recommendations made, should be considered as tentative.

Appreciation is expressed to all who made this review possible: to the members of the Interagency Panel on Early Childhood Research and Development for pursuing the often tedious task of reporting to the information system; to Dr.Edith Grotberg who provided knowledge and guidance at all stages, and to Yuki Carnes who did much of the abstracting for this project.

Joyce B. Lazar

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HIGHLIGHTS

Summary

There are a number of longitudinal studies of the physical and psychological growth and development of young children now being conducted at Universities and Institutes around the country. Most of these Institutes have been gathering data for many years, and are funded primarily by non-federal sources including foundations and industry. Nearly all these programs are following small local samples of children and rarely include children from all socio-economic or ethnic groups.

Member agencies of the Interagency Panel on Early Childhood Research and Development have reported a total of 96 longitudinal studies of change for FY 70 and 71. Of these, nine are studies of normal physical development, 16 of abnormal or atypical physical and psychological development, 22 of cognitive development and 11 of socio-emotional development. Thirty-five of the longitudinal studies are assessing the impacts of intervention programs; all but seven of these are educational interventions with preschool children, or follow-up into elementary school of children who were in preschool intervention programs.

While nearly half of the basic descriptive studies are attempting to gather data on representative samples of children, all of the intervention studies are measuring changes in special populations. They focus primarily on children from low income families; a few are studies of children with physical or psychological handicaps. Most of the studies, especially in physical and cognitive development, are initiated with infants and children under the age of three years. With the exception of a few long term studies of physical growth, nearly all of these longitudinal studies are assessing short term changes - less than three years.

Longitudinal Descriptive Studies

There is a general lack of federal funding of long range studies which follow the natural development of children prenatally through maturity. There is a need to develop new long term studies, based on a national representative sample of children utilizing new measurement instruments and data processing

techniques to provide information in the following areas;

1. Study the relationship of environmental characteristics including levels of radio active and other pollution of air, water and soil on the biological and psychological development of children.

2. Continue to examine the relationship between genetic and environmental variables on the physical, cognitive, and psychological development of representative samples of children.

3. Continue to explore the biological correlates of behavior, including effects of prematurity, low birth weight, nutrition, etc. on the whole developmental process.

4. Study cognitive development in a broader theoretical framework, and t study its relationship to genetic factors, prenatal and early infancy environmental variables, as well as family constellation interactions and various cultural and subcultural and ethnic differences.

5. There is need to know more about the characteristics of the successful learning situation, learning styles and processes.

6. Explore new technological developments and their relationship with learning among children of all ages.

7. Study the life span socio-emotional development of "normal" as well as disturbed children, with emphasis on determining the stability of many traits as well as "general adjustment."

8. Develop techniques to observe and measure interpersonal interactions more complex than dyads. Family interaction, not just mother-child interaction needs investigation.

9. The effects of peer groups at all ages on the cognitive and social development of children needs further investigation.

10. Study how children learn to cooperate, pursue mutual goals, and work as a group and for the group.

11. Continue to develop instruments for measuring cognitive development which are culture-fair. Instruments to measure and assess social-emotional development at the earliest stages and throughout childhood are needed.

12. There is a need to develop instruments to measure the various discrete stages which take place in the growth of children.

13. Inter-agency funding, of multi-disciplinary projects which gather data in various locations on representative samples of children need special attention.

14. Existing data banks, including those of some of the long-term growth studies and the perinatal project, can be more fully utilized and analyzed.

Preschool Intervention Research

A review of recent research indicates that nearly all studies report that short term interventions produce immediate increases in I.Q. and achievement, but that for the most part these interventions do not make long term differences in either I.Q. or achievement unless the intervention continues into the elementary schools.

Recently funded ongoing studies are initiating intervention at younger ages, are attempting to alter a larger number of environmental conditions, and are refining and articulating their curricula more carefully. Studies are shifting from Treatment-No-Treatment models to comparisons of various types of interventions. In currently funded research, intervention is being continued for longer periods of time, there is an increase in the range and types of impact (other than I.Q. and achievement) being measured, and the findings are being analyzed more closely. As the results of these current studies are reported, there should be more information available on how young, and how long, intervention must continue for gains to be maintained. The following areas need further investigation:

1. Optimal times for specific interventions. For example, the optimal time to initiate nutritional intervention is probably prenatally. Optimal initiation times for other interventions need to be established as well as optimal durations for specific types of interventions.

2. The impacts of all program components need further assessment. These include medical, social service, counselling and guidance, as well as parent education. Impact on parents, children as well as the family constellation need to be studied.

3. The effects of parent participation in decision-making also needs assessment in terms of its impact on the parents themselves, the community, and the children.

4. Intervention programs need to be assessed in terms of possible negative impacts on the children, on their families, on the relationship between the children and their families, or on the community.

I. INTRODUCTION

Overview

In order to identify the gaps in longitudinal studies in early childhood research and development funded in FY 70 and 71, it was first necessary to do a brief review of the literature to identify and examine the findings of some of the ongoing longitudinal studies. This paper attempts to define the term "longitudinal research," then presents a brief and far from comprehensive overview of longitudinal research in various areas of early childhood. A complete description and analysis of the studies reported in FY 70 and 71 by the members of the Interagency Panel on Early Childhood Research and Development is presented. And finally, the attempt is made to identify the major areas and populations needing further long term research.

Currently funded investigations are divided into two broad categories: longitudinal descriptive study and intervention research. The longitudinal descriptive studies are divided into those dealing primarily with Normal and Abnormal Physical and Psychological Development, Cognitive and Social-emotional Development. Intervention studies are divided into two categories: Physical and Psychological Treatment and Early Educational Intervention.

Longitudinal Research Defined

When data were gathered from participating agencies of the Interagency Panel on Early Childhood Research and Development, longitudinal research was defined as: "studies which trace changes over weeks, months, and years, and show how events (whether "natural" or experimental interventions) during certain points in childhood affect characteristics later in childhood, or even later in life." Such a definition includes short and long term studies as well as cross-sectional studies which measure change over time.

For the purpose of this review, a distinction has been made between basic studies of the ongoing developmental processes, and studies in which there was a deliberate attempt to change these processes. The following definitions should clarify this distinction:

Longitudinal Descriptive Studies in child growth and development are those which measure changes in physical, mental, or socio-emotional development, or any combination of these over a period of time in the same subjects,

when no experimental intervention other than the data collection situation has been introduced. Such studies may cover a brief period of time, perhaps limited to the neonatal period, or they may be very long term studies which cover the entire life span. Descriptive studies may be cross-sectional ones utilizing current or existing data.

Longitudinal Intervention Studies are those which measure the change due to an experimentally introduced treatment, remedial variable or change agent. Studies may range from a single, one time intervention, as for example in the case of a vaccine or drug, to comprehensive intervention over many years. Such studies may also be cross-sectional utilizing current or pre-existing data in which there are pre and post measures.

II. A BRIEF REVIEW OF LONGITUDINAL STUDIES IN CHILD DEVELOPMENT

Longitudinal studies were among the earliest research in child growth. The areas investigated in these studies roughly paralleled the sequential development of methodologies, instrumentation and technology as well as evolving scientific and social philosophies. In the first phase, studies were of the physical development followed by behavioral studies of children and utilized case study and anecdotal materials. Investigations of intelligence began with the development of the Stanford-Binet. Larger studies in both physical and phychological development were initiated as research designs, sampling techniques, statistical treatment of data, and finally computer processing of large masses of data become available. Later small scale intervention studies were initiated to measure the impact of various treatment procedures, preventive measures and programs of physical, psychological or educational remediation. Finally, large scale collaborative research and social intervention programs were developed and their finding evaluated, often on a national basis.

Early Studies of Physical Growth and Development

Initial longitudinal studies of the physical growth of children were conducted by physiologists. One of the first, if not the first such study was conducted between 1759 and 1776 by the French physiologist Buffon, in which he reported the 17 year changes in the height of one child. This was followed by a number of long term case studies of the growth and behavior of one child, including studies by Perez (1878), Moore and Mrs. W.S. Hall in 1896. These case histories soon gave way to longitudinal studies of larger numbers of children. Still concerned primarily with recording of physical growth of children, a major study was initiated at Harvard University in 1872 by the physiologist Bodditch. A second Harvard growth study was conducted between 1910 and 1920. In 1921 Baldwin published comparable data on a series of individual growth curves of children in Iowa.

Early Studies of Physical and Psychological Growth

Initially, studies of the behavior, physical and psychological development of children were also case studies of one, or a small number of children.

One such study began in 1902 and published by Smith in 1952 was a 50 year follow-up of diary descriptions kept by a mother of the behavioral development of her three sons and three daughters. With the development of the measurement of intelligence by Binet in 1916, a number of universities began multidisciplinary studies of the physical and intellectual development of children. Some also attempted to record developmental stages in behavior. Most, but not all of these studies included information about the socio-economic status and ethnic background of the subjects. Generally, the subjects in these studies were predominantly white and middle class and a self-selected sample.

Among the longitudinal studies first initiated were the developmental data of Gesell and the Terman study of gifted children with its 35 year follow-up. The Berkeley Growth Study begun by Jones and Bailey in 1928 and the Study at Fels Research Institute initiated in 1929 are still on-going and have provided a wealth of data reported by them and from which others have drawn.

These longitudinal studies provided information on the stability of the I.Q., the predictive accuracy of early I.Q.s, variability of rates of intellectual development as well as the psychological correlates of change in intellectual ability. Bayley and her associates noted that mental growth developed at variable rates among different children, and that I.Q. scores obtained before 18 months of age were poor predictors of later I.Q. Sontag, Baker and Nelson (1958) used the longitudinal data from the Fels Institute to investigate changes in Stanford-Binet I.Q. in the early school years. They found that some children showed substantial increases in I.Q. - up to 40 points, while others showed similar decreases. They reported that increases were related to the traits of competitiveness and independence. Gesell in 1939 produced motion picture records of five children taken at one and five years of age, and found that there was a remarkable stability in many aspects of behavior over the four year period. See Appendix A for a list and description of some ongoing longitudinal descriptive studies.

Early Intervention Research

While these longitudinal studies of the physical and psychological growth of children were progressing, and methodologies and instruments were being refined, significant changes were also taking place in social psychological research. In 1931 Kurt Lewin began to describe the functioning of the child

in what he called the "life space" or psychological field. Lewin's initial work of studying psychological behavior in terms of the interrelations within the group was followed by what he then called "Action Research." His orientation was summed up by Lippitt (1947) in the term "Scientific Citizen." This term explained Lewin's dual premise that the best way to understand a situation was to attempt to change it, and that a scientist should have a social conscience and actively try to make the world a better place in which to live. Lewin and his followers initiated a number of intervention studies in which they attempted to alter a situation while at the same time studying the relationships in the situation.

Researchers in various fields of child growth and development began to synthesize data from longitudinal studies and to utilize new research methods. There developed an understanding of the interrelationships between demographic variables and environmental influences on physical stature, and on neurological development. Evidence began to accumulate on the mutability of I.Q. and the conditions which affect I.Q. changes. From these understandings as well as a growing social concern about the rights of all individuals emerged a number of longitudinal research projects which attempted to change, and to study the conditions of change in the development of children. The now famous and often quoted Skeels study was perhaps the first of these intervention studies which measured changes in I.Q. as related to life situation.

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The Skeels study (1938) of two groups of mentally retarded children indicated that a radical change in the total life situation and the "mothering" of the experimental children could bring about an I.Q. gain of 28 points, whereas the control group dropped 26 points. Further, a 30 year follow-up of these children showed that the experimental group were all self supporting adults, while the control group were either dead or still institutionalized. Bronfenbrenner (1970) has termed this approach "experimental human ecology." He states that "the full import of the ecological systems for the development of both science and social policy is not to be sought in experiments of nature but in experiments of man." He defines experimental human ecology as the deliberate design, systematic manipulation and scientific analysis of new ecological settings that can affect primary socialization processes.

In recent years there has been an increase in the proportion of funds allocated to applied intervention studies and to projects assessing the

effects of these interventions. Some of these intervention projects are in the area of treatment of physical and/or psychological problems, but the vast increase in funds has been in early childhood education programs for low income children. Based on the initial findings of Skeels, a few early childhood intervention studies were initiated in the late 1950's. Strodbeck worked with Ghetto children and Kirk with institutionalized children and reported that language development could be influenced by intervention. Deutsch began his preschool intervention studies in 1958. In 1961 Susan Gray and her associates began what was to become a model for many intervention programs with low income children. Her program included the use of paraprofessionals to provide intensive cognitive stimulation. Her positive findings along with those of Weikart and his Perry Preschool Project quickly lead to a proliferation of such projects, not all of which were as carefully planned or evaluated. With the advent of the poverty program in 1964, large scale intervention with preschool children was initiated through Project Head Start in 1965. The major longitudinal studies in this area will be discussed in the section on Intervention Studies.

Advantages and Problems Involved in Conducting Longitudinal Research

The observation of the same children over a period of time, even if the number of children observed is limited, provides data about the developmental process and long range impacts which can be accumulated in no other way. All scientific research depends upon periodic new observations which are full and detailed. From these observations may come new hypotheses which might not be deducible from a tightly designed research design or theoretical system.

Much of the literature of childhood research deals with problem areas and problem children. Longitudinal studies of the physical and psychological development of normal children provides information about how children react to, cope with, and adjust to life stages, to life's rewards as well as its stresses. Long term studies which follow the development of children over many years must deal with a number of difficulties, however, not the least of which is continued, stable funding. Among these difficulties are:

1. Research Design: in the initial stages of long term studies, data were

sometimes collected without a well thought out design. Because of this, early studies often received professional criticism which made later funding of new studies of growth and development difficult to obtain.

2. Sample problems:

Size of sample:

Because of the amount of data collected on children as well as the funding, samples have generally been too small to allow for much generalization.

Representativeness of sample:

Long term studies have rarely been able to obtain representative samples in spite of efforts to overcome this limitation. For the most part, data from longitudinal studies are on white middle class children whose parents were interested enough in the research project to continue to take part in the program, and who lived close to a major university or research center.

Attrition of the sample:

Shrinkage of already small samples occur over time because of a loss of rapport between the researchers and the family, or because of mobility (one American family in five moves every year).

3. The effects of continued observation and testing:

Effects in long term studies include Observer effects, the Hawthorne effect, and an increasing awareness and greater capacity among subjects to observe and report. As years go by, the sample may become increasingly different from a control group primarily because of participation in the research situation.

4. Continuity of staffing:

Commitment:

For a principal investigator to commit himself to life-span observations necessitates an on-going dedication to one particular area of research, and the certainty that the investigator will not live to report on the final stages of the investigation.

Continuity:

If the principle investigator leaves the project, there may be a shift in focus or interest when a new principle investigator takes over. It is also difficult to keep staff at other levels for very long studies. This raises problems of observer and/or tester differences.

5. Testing procedures:

Testing schedules:

Every longitudinal study must face the dilemma of choice between fixed and flexible procedures over the span of years. On fixed schedules, children are ill or on vacation and cannot be observed as scheduled.

Instrument Revision:

As years pass, measurement and evaluation instruments are revised or new instruments developed. A choice must be made between continuing with the instrument initially used, or shifting to improved or new measures.

6. Data processing:

The mass of data collected always presents problems in data processing, and decisions must be made as to what to process. Improved data processing methods over the years as well as new statistical procedures present both new opportunities and new dilemmas.

7. Environmental changes:

Subjects in longitudinal studies are influenced by both national and local changes in the environment. Major events such as war and depression may exert both unmeasured or unmeasurable influences. Shifts in cultural mores, social attitudes and values may do the same. Of even more significance, local environmental changes may affect the test sample in such a way that it may then differ greatly from a similar sample in the larger population. Great local disasters such as earthquakes and floods, as well as high local unemployment are examples of such environmental changes.

III. LONGITUDINAL DESCRIPTIVE STUDIES

Longitudinal Descriptive Studies of Physical and Psychological Development, Funded in FY 70 and 71 include 25 studies of physical and psychological development of children, 22 of cognitive development and 11 of normal social-emotional development as shown in the following table.*

TABLE I

LONGITUDINAL RESEARCH REPORTED DURING FY 70 AND 71

DESCRIPTIVE RESEARCH N=58	
Normal Physical Development	9
Abnormal Physical and Psychological Development	16
Cognitive Development	22
Socio-Emotional Development	11
INTERVENTION RESEARCH N=35	
Physical and Psychological Treatment	7
Educational Intervention	
With Children Under Three	14
Preschool and School Age	14
OTHER LONGITUDINAL STUDIES N=3	3
Total	96

Of the 25 studies of physical and psychological development reported by federal agencies in FY 70 and 71 (See Appendix B for a listing and brief description of these projects) to the information system of the Interagency Panel on Early Childhood Research and Development, nine are studies of physical growth including skeletal, dento-facial growth, changes in body chemistry and revision of normative charts of growth rates. Another 11 are studies of atypical or abnormal physical growth, including four of chromosomal

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*This categorization, like all categorizations is somewhat arbitrary, since a number of the studies are investigating two or more aspects of child growth, and in reality, children are whole children, and not divided into these artificial categories.

anomalies, two of the effects of nutritional deficits on growth and development, and one each of immunology, gastric disturbances and of bio-medical aspects of mental retardation. Five other studies deal with physiological aspects of schizophrenia and other pathological behaviors. Included in this group is a study of the subsequent psychological behavior of battered children, Anna Freud's on-going assessment of the impact on later mental health of childhood pathology, a long range comprehensive study of autistic children, and an investigation of the relationship between psychological disturbances of low income children and their later achievement in the first grade.

Research Needs in Descriptive Studies in Physical and Psychological Development.

1. Continue and expand on-going studies of the relationship of environmental characteristics, including levels of radio active and other pollution of air, water and soil on the biological and psychological development of children.
2. Continue studies of the effects of pre- and post-natal nutritional deficiencies on physical, cognitive, and psychological development of children at all ages.
3. Continue and expand studies of biological correlates of behavior, including genetic differences, prematurity, low birth weight, nutrition, etc. throughout the whole child development process.
4. Develop new longitudinal studies of the physical, cognitive and socio-emotional growth and the relationship between these areas, with major effort to secure a representative sample of all socio-economic levels, and particularly with Indian, Spanish-American and Black and rural children adequately represented.
5. Develop interagency fundings of multi-disciplinary studies which encourage the cooperation of the various relevant professional groups.
6. Longitudinal studies in the physical development of children need to focus on the development of the "whole child" in his "life space."

Longitudinal Descriptive Research in the Development of Cognition

The 22 longitudinal studies in the development of cognition have been divided into four categories, although at times this classification is somewhat

arbitrary or overlapping. These subcategories include: Perception and Attention, the Development of Language, Mother-child Interaction and the Development of Competence.

The early development of sensory perception, selective attention and the transition from sensorimotor to verbal intelligence is being investigated in five studies. One of these is examining perceptual development among twins and making within and between pair comparisons. Another is investigating differences in perceptual capacity of retarded and normal children. A third study is observing the development of discrimination from birth through the first year of life. Developmental changes in selective attention is being investigated in another study, and the transition from sensorimotor to verbal intelligence during the 18 - 36 month period in the final study.

The development of language and its relationship to cognitive development is being investigated in five studies. Areas of language development being investigated include the development of the encoding mechanism, the role of hesitations both in language acquisition and in comprehension of adult speech by children, and the relationship between language development and cognitive functioning. Two are comparative studies: one of language development among middle and low income children in the United States, and the other between French and American children.

The relationship between maternal-child interaction and the development of cognition are the primary focus of four currently funded longitudinal studies. Two of these are examining mother-child interactions among Negro families, one a sample of white upper-middle class SES and Harlem lower SES families, and the fourth low income families.

Eight longitudinal studies are examining the development of competence and achievement. The first of these is the on-going research at Harvard Center for Cognitive Studies which is examining the growth of competence in infancy. Another is examining specific measures in the home environment in a sample of infants between 12 and 24 months and following their intellectual functioning for an unspecified period of time afterwards. Early influences leading to the development of self-confidence, achievement motivation and competence among two year olds is being studied. A fourth study is examining the development of competence during the first six years of life. The relationship between the child's motivation to achieve, his anxiety to achieve,

and his scholastic performance in school is the major focus of another study. The relationship between temperament and task orientation in the preschool period and level of academic achievement in elementary school is being investigated with a sample of middle and upper SES boys and girls, studied from birth through elementary school. The relationship between the achievement behavior of children and that of their parents is the focus of the another study.

The largest longitudinal study of educational achievement is a follow-up of a sample of 1240 children whose mothers were participants in the Collaborative Perinatal research project. This study is intended as a prototype for further use by 12 participating hospitals, and will investigate the relationships between conditions of pregnancy, birth and infancy with later school achievement and behavior.

Among currently funded longitudinal studies of cognitive development, there is a heavy emphasis on the study of infancy and the earliest years of life as shown on Table II. Three of the studies in perceptual development are with children under three years of age; the other two are with older preschool children. All four of the studies of the development of language are with children under four years of age, and all of the studies of maternal-child interaction are with infants and preschoolers. Of the studies in the development of competence, three deal only with infants and children up to the age of three, one is following children between the ages of one and six, two are examining competence among preschool and school age children, and one the relationship between adult competence and that of their children. The follow-up of the perinatal project is studying achievement behavior over the longest time span - prenatal through elementary school.

Of the 22 studies of cognitive development, twelve are using representative samples of all children, three are comparisons between middle and lower SES samples, two are of children from low income families only, and one is of children from upper and middle income families only. Two studies are limited to black children, one to retarded children, and one is a cross-cultural study. There are no ongoing longitudinal studies of cognitive development focused on Spanish-American or Indian children reported at this time.

TABLE II

STUDY AREAS, AGES AND POPULATIONS OF FY 70 AND 71
LONGITUDINAL RESEARCH IN COGNITIVE DEVELOPMENT

Study Areas	
Perception and Attention	5
Development of Language	5
Mother-Child Interaction	4
Development of Competence	8
Ages	
Birth through 3 years only	6
Birth through 4 years only	5
Birth through 6 years only	5
Perinatal through elementary school	1
Preschool through 12 years	2
Preschool child-adult comparison	1
Unspecified	2
Populations	
Representative samples of all children	12
Comparisons Middle-Low SES	3
Low income only	2
Middle and upper income only	1
Black only	2
Other (retarded, cross-cultural)	2

Needs in Longitudinal Research in Cognitive Development

1. Study of cognitive development in a broader framework, including its relationship to prenatal and early infancy environmental variables such as nutrition, family constellation interactions, and sub-cultural and ethnic differences.

2. Further systematic investigations of theories of cognition and cognitive development in order to:

   A. Clarify components of sequential steps of cognitive development,

   B. Identify subprocesses of learning and thinking skills including, curiosity, initiative organization, planning, flexibility, task orientation, discrimination skills, ability to identify and react to relevant cues, as well as learning styles, information processing and problem-solving behaviors, symbolic behavior and various types of mediation.

3. More information about the characteristics of successful learning situations, conditions of instruction, including how the timing and sequence of instruction in intellectual skills relate to characteristics of the child including age, I.Q., SES and ethnicity over a period of time.

4. Continuing long term studies of the ways in which genetic endowment interacts with environmental factors to determine the development of intellectual competence.

5. Investigate new technological developments as TV, programmed instruction, computer assisted learning relates to various aspects of learning and long term retention.

6. Develop longitudinal studies of the cognitive development of children of Spanish-American and Indian families.

Longitudinal Descriptive Studies of Social Emotional Development

The FY 70 and 71 fundings reported only a total of eleven studies with normal chidlren. Two of these are studies of the development of affective responses in babies, one of American babies and the other a comparison between American and Japanese babies. Three studies are investigating the process of ego development and of self-control. One of these is studying the development of ego and self-control in a cross section of children ages three to seven, another in infants four to 12 months and children five to 11 years. The third study in self-control is investigating the processes by which a child will learn the moral rules of society in such a way that he will not deviate from

those rules even when the possibility of being caught for infractions is very small. Also in process is a study that is developing methods of assessing behavior over the first two to three years of life.

Five of the descriptive studies of the socio-emotional development of young children are ecological or environmental investigations. One of these is attempting to develop a classification system for evaluating and comparing environmental variables in group and home care settings of 30 preschool children. Another is a cross-sectional investigation of the ecological milieu of various preschool subsettings and analyzing the effects on the behavior of a representative sample of 40 children between the ages of two and five years.

Two anthropological studies are investigating environmental influences on child development; one is a three year study of the living habits of Bushmen, and the other a study of family and peer group impact on the socialization process in four different socializing settings in Israel. The final study in this group is investigating environmental aspects of the socialization of deprived Negro children in an urban ghetto. Areas being investigated in this study include the home, school, and peer cultures of kindergarten through second grade.

Needs in Descriptive Research in Socio-emotional Development. It has often been pointed out that there has been an over-emphasis on studies focusing on the cognitive development of children and too little study of social-emotional development. Currently funded research would lend some support to this contention. The following statements appear justified:

1. There is a general lack of support for longitudinal research in the area of social-emotional development.
2. Such studies as are funded, are rather narrow in scope.
3. More studies are needed to determine the stability of many aspects of early social development including affective behavior, the development of self-control, of self-concept, and of ego development and their relationship to later adolescent and adult behavior.
4. There is a need to develop techniques for examining various interpersonal interactions more complex than dyads. The entire constellation of family interaction, not just mother-child interaction, needs to be examined in

terms of its impact on the socio-emotional development of children of all ages.

5. There is a need to examine the long term process of socialization, not just isolated traits at discrete intervals.

6. There is need to investigate the impact of the peer group on the process of socialization from earliest interactions through the school and young adult years.

7. Already existing instruments need further refinement, and there is the need to develop new observation and measurements for studying interactive behavior.

8. The relationship between social-emotional development and functioning, and cognitive development and functioning needs further long term investigation.

9. More knowledge is needed about how children learn to cooperate, pursue mutual goals, work as a group and for the group.

IV. LONGITUDINAL STUDIES OF INTERVENTION

Physical and Psychological Treatment

Of the 35 longitudinal intervention studies reported to the Information Secretariat in FY 70 and 71, only seven are investigations of physical and psychological treatment. This small number is more a reflection of the mandates of the agencies included in the reporting system than on the actual amount of research being conducted in these areas. Longitudinal studies of physical treatment and therapy are for the most part funded by NIH agencies not included in this reporting system. For this reason, no attempt will be made to review other studies or identify gaps in the area of physical intervention. Briefly, the seven longitudinal studies of physical and psychological treatment include three drug studies and one study of the effects of phototherapy. One study is examining a variety of techniques for working with deaf children and another with children who stutter. A follow-up study is under way to determine the stability of effects of reinforcement therapy.

Discussion of Findings of Previously Funded Longitudinal Studies of Infant and Preschool Intervention Programs

The amount of research aimed at measuring the change resulting from various intervention techniques with infants and preschool children has proliferated in recent years. A brief history of the development of preschools and a report of some of the major studies are included in Appendix C. A more extensive review of the findings of a large number of model or experimental programs as well as of Head Start evaluations was prepared by Marian Stearns (1971), and another discussing the findings of seven programs by Sally Ryan (1971). For the purposes of this paper, the findings of prior studies will merely be summarized,* trends in current fundings discussed, and existing gaps indicated.

A review of the literature of preschool intervention programs indicates

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*See Appendix D for a list of the Experimental Intervention Studies in Preschool Education reviewed in preparing this summary.

that:

1. Nearly all studies report that short term interventions produce immediate increases in I.Q. and Achievement.

   Increases are reported by programs which work only with the child,
   by programs which work with the child as well as the family,
   by programs which work with the family only.

   The amount of increase seems to be related to the kind of experience the child has in the program. Small, well designed model programs report greater gains than mass programs.

   The amount of increase does NOT seem to be related to:
   The age at which the child enters the program (at least, between two and five),

   The length of time the child spends in the program.

2. With few exceptions, short term preschool interventions do not appear to make long term differences in either I.Q. or Achievement unless the intervention continues into the elementary school grades.

   Continuity of gain has been maintained when:
   the preschool intervention and primary grade program is coordinated within the elementary school. (Deutsch)

   Follow through programs which emphasize individual instruction in the public schools appear to increase Head Start children's gains in kindergarten and first grade. (Abelson)

   Summer programs for the children, and home visits to parents throughout the year seem to maintain gains even when there is no continuing intervention in the schools. (Gray)

3. Even in programs where interventions have been comprehensive, assessments have been narrow.

   Because better instruments exist to measure cognitive changes than socio-emotional changes, and because the effects of medical and social service inputs are difficult to measure, most early reports concentrated on describing cognitive gains only, even though the programs provided a variety of services.

The FY 70 and 71 Longitudinal Studies of Infant and Preschool Intervention

Most of the longitudinal intervention studies funded in the last two fiscal years are in the area of infant and preschool intervention. Of the 28 studies funded, half are with infants and children under three years of age at the initiation of the study. This reflects the increasing interest in earlier and earlier intervention.

Five of the infant intervention studies are home learning programs to stimulate interaction between family members, mainly mothers and their infants. Five of the studies are being conducted in day care centers which also provide parent education and involvement. Two studies are assessing the differential impacts of various instructional techniques on the long term development of social, cognitive, language and behavior. A third study is comparing four strategies of infant intervention in an Iranian orphanage. The final study is assessing the impact of the comprehensive intervention programs of the 32 Parent-Child Centers.

Among the intervention programs with children over the age of three years are three comparisons of the impact of various curricula on both short and long term gains of disadvantaged children. Included in this group are the Planned Variations study, the Miller study of four kinds of educational programs at the prekindergarten level and a longitudinal study of four sites providing preschool programs for children three and a half and following them through the first grade. Another study is examining background variables in predicting future scholastic achievement of preschool children from low and middle income families. Three studies are examining longitudinal effects of various day care interventions; two are of model, center-based day care situations, and one is examining the impact of an indigenously operated day care center. One study is evaluating the effects of a tutorial program initiated with three and four year olds, and another is exploring the long range impact of involving parents of infants and preschoolers in the public school situation. Two studies are assessing innovative curricula and one reading problems starting with kindergarten children and following them through the sixth grade. Included in this group also is the longitudinal evaluation of the National Follow Through program. The final study is assessing the long term impact on child development of various housing programs.

An analysis of currently funded studies of longitudinal interventions

indicates that:

Intervention is being initiated at younger ages.

There is a shift from beginning intervention programs with four and five year olds to beginning with infants. In the past two years, half of all educational intervention studies were initiated with infants and children under the age of three. In a review of the literature, Stearns (1971) reports that at least between the ages of two and six, age at intervention did not seem crucial to the amount of immediate change in intellectual performance. Similar findings were reported by Schaefer (1971), Palmer (1968), Karnes et. al. (1970), and Weikart (1967). At the present time it is not known whether earlier intervention will influence either the amount or continuity of effect.

Intervention studies are attempting to alter a larger number of environmental conditions.

Though not attempting total environmental change such as done in the Skeels study, present early intervention programs are attempting to alter or modify a larger number of aspects of the environment. Interventions are more apt to include comprehensive services such as family and child health, employment of parents, nutrition, social services etc. One study is looking at the effects of housing, but this, and income of parents is rarely part of the environmental intervention at the present time.

Intervention Studies are refining and articulating their curricula more carefully.

Based on information from nearly ten years of model experimental programs and six years of Head Start, curricula have been refined and are more carefully defined in most current investigations. This includes studies of replication of experimental curricula in new sites. Current studies are also articulating from one level to another more carefully.

Comparative studies are shifting from Treatment-No-Treatment models to comparisons of various types of interventions.

Most earlier studies had control groups in which no intervention was attempted. Current studies include more comparisons of various types

of intervention. The largest such study is Planned Variations, but other researchers (Karnes, Weikart, Beller, and Miller) are now examining differences within and between programs.

Intervention is being continued for longer periods of time.

Based on findings of large numbers of studies that short term interventions yielded only short term gains, most of the currently funded studies are planning to follow up with the intervention program until the children are well into the elementary grades. The largest such program is Follow Through. Many of the experimental models are attempting to start earlier and continue longer.

There is an increase in the range and types of impact being measured.

Early studies concentrated their assessments of outcome on changes in I.Q. and achievement. Current investigations are using a wider variety of instruments to measure changes in I.Q. achievement and learning styles, but also in various aspects of socio-emotional change. Measures include self-concept, motivation, mother-child attachment, dealing with frustration, dealing with strange people and new ideas, and other affective developmental changes.

Findings are being analyzed more closely.

Whereas initial studies reported gross differences in I.Q. and achievement between the entire experimental and control group, more recent studies are examining both sub groups and sub tests. Types of curricula are being analyzed in terms of differential impact with sub groups based on sex, ethnic and SES differences. This type of analysis is aimed at identifying specific types of interventions appropriate for specific groups of children.

Needs in Early Educational Intervention Research. Many of the criticisms of the early educational intervention programs have lead to changes in programs now funded, and it can be anticipated that some of the existing gaps in knowledge will be filled when the findings of these intervention studies have been reported. At the present time we still need information on the following:

1. Where is need to know how early it is necessary to initiate enrichment programs in order to maintain continuity of gains.
2. There is need to learn how long enrichment programs must continue in order to maintain continuity of gains.
3. There is a need to establish optimal times for specific interventions. For example, the optimal time to initiate nutritional intervention is probably prenatally. Optimal times for other interventions and enrichments need to be established.
4. There is need to know the impact of various program components: medical, social service, counselling and guidance, as well as parent education on parents and children.
5. The effect of participation of parents in decision-making positions has not been fully evaluated to determine their effect on program content and operations, staff, children, as well as on the parents who do or do not participate.
6. There is need for further longitudinal intervention studies with Indians, with Puerto Ricans and with Mexican-Americans as well as the on-going studies of Black families.
7. There is need to follow up interventions with a view for possible negative impacts on either children or their families.

Overall Recommendations. It is important to initiate life span studies of growth and development periodically in order to obtain information based on recent refinements in research design and methodology including sampling techniques and new or revised instruments as well as improved data processing methods. It is also important to increase the scope of these studies to include participation by all relevant disciplines, and to study national samples of children of all ethnic, racial and socio-economic groups.

APPENDIX A

SOME MAJOR LONGITUDINAL DESCRIPTIVE STUDIES

	Ongoing Since
Merrill-Palmer Institute	1920
Harvard Growth Study	1922
Child Research Council, Univ. of Colorado	1923
Berkeley Growth Study	1928
Fels Research Institute	1929
Growth Research Unit. Inst. Med. Sciences	1929
Oakland Growth Study	1932
Methods in Character Development, Union College	1935
berkeley Guidance Study	1938
Philadelphia Center for Research in Child Growth	
Kaiser-Permanente Research Institute	
Longitudinal Study of Dentofacial, Skeletal And Physical Growth and Nutrition	1950
Radiographic Atlases of Skeletal Development Case Western Reserve	1956
Collaborative Research Perinatal Project	1959
Collaborative Studies in Cerebral Palsy and Other Neurological and Sensory Disorders in Infancy and Childhood	1956
Growth of Psychophysiological Patterns in Infance, Albert Einstein	1966
Child Development Research Project	1967
Program in Child Welfare Research, Yale Univ.	1967
Harvard Center for Cognitive Studies	

LONGITUDINAL RESEARCH

Physical Development

University of Colorado Medical Center; Commonwealth Fund; National Dairy Council; Gerber Products Co.; Nutrition Foundation; Phipps Foundation; and NICHD

THE CHILD RESEARCH COUNCIL

Life-span investigations of growth, development, and adaptation of healthy volunteer subjects. 215 healthy middle and upper-middle class volunteers from Denver, ages one year to 48 years. Current operation is limited to analysis of data collected since 1930 in the areas of physical growth, roentgenographic studies of growth, nutritional intakes, health records, and selected areas of biochemical and functional development. Data are being organized on electronic tape for computer analysis. Projected activity in the coming year includes analysis and publication. On-going since 1923.

Permanente Medical Group; Kaiser Foundation Research Institute

BIOLOGIC AND ENVIRONMENTAL FACTORS IN CHILD DEVELOPMENT

To investigate the relationship of biologic, genetic, and environmental factors in the parents--including events during pregnancy, labor, and delivery--to normal and abnormal development of offspring. Expected byproducts of investigation are relationships of these factors to pregnancy wastage in the form of early fetal death, perinatal mortality, infant and childhood mortality, and estimates of incidence of different types of abnormalities. In addition, detailed growth curves for children from birth to six years of age will be derived on a longitudinal basis, also estimates of illnesses and injuries in infancy and the preschool child. Subjects are members of the Kaiser Foundation Health Plan--a prepaid medical care program--who reside in the San Francisco-East Bay Area. Study is of a prospective, longitudinal type for both mother and child. Observations are made on the gravidas in the Department of Obstetrics and Gynecology, and on the children in the Pediatric Department, and are supplemented by special interviews and laboratory examinations. Physicians' observations are systematized and made more uniform. Special efforts are made to obtain information on members of study who do not return to the plan for medical care.

NIH

COLLABORATIVE RESEARCH PERINATAL PROJECT

Relationship of pregnancy factors, of complications of labor and delivery,

and of events of early infancy to neurological, intellectual and other deviations in child development. Planning for study initiated in 1954 with data collection beginning in 1959. 14 participating hospitals are studying 56,000 pregnancies between 1959 and 1965. Observations of the children to continue until age eight.

Children's Hospital of Philadelphia; Philadelphia Board of Public Education; School System, Archdiocese of Philadelphia; NIDR and NICHD.

PHILADELPHIA CENTER FOR RESEARCH IN CHILD GROWTH

To develop standards and norms of physical growth and development of normal, healthy children of the Philadelphia area. White and Negro children, male and female. Data are longitudinal (usually annual), based on two major samples: birth to seven years, and seven to 17 years. Cephalometric (measurement of head, face, jaws) and somatometric (trunk, limbs) standards of second group (white, colored) are already available; those of first group (white only) will be within the year.

Institute of Medical Sciences; Service for Developmentally Handicapped Children

GROWTH RESEARCH UNIT

To gain insight into critical factors influencing growth patterns of all children by observing the growth and development of deviates, especially those with pathological diagnoses which have been medically documented. Children with congenital cardiac lesions, and children and adolescents with significant deviations of physical, neurological, and behavioral development.

Oregon State Board of Dental Examiners; Tektronix Foundation, Inc.; Medical Research Foundation of Oregon; National Dairy Council; and NIH

LONGITUDINAL STUDY OF DENTOFACIAL, SKELETAL, PHYSICAL GROWTH, AND NUTRITION OF CHILDREN

To study the dentofacial growth of children, standards of nutrition, caries increment as related to nutrition, assessment and skeletal age as related to facial growth, variations in physique and its effect on dentofacial growth. Twins are also being studied to determine heritable traits. 400 children, including 40 pairs of twins, ages three to 18 years, who have been observed for periods of three to ten years.

Physical Development

S. Idell Pyle, Ph. D., Research Associate, Department of Anatomy, Western Reserve University School of Medicine, Cleveland, Ohio; and NICHD

RADIOGRAPHIC ATLASES OF SKELETAL DEVELOPMENT

To develop radiographic standards of skeletal development for use as reference standards for children. Series of films of hand, elbow, shoulder, hip, knee, and foot of healthy children are used to identify the modal (moderate) rate of bone development. Revisions of the 1955 Knee Standard and the 1959 Hand Standard have been tested since 1965.

National Institute of Neurological Diseases and Blindness

COLLABORATIVE STUDIES IN CEREBRAL PALSY AND OTHER NEUROLOGICAL AND SENSORY DISORDERS OF INFANCY AND CHILDHOOD

To investigate factors and conditions affecting parents: (1) conditions of pregnancy itself, such as infections, trauma, bleeding, drugs, and progress of labor; (2) environmental factors influencing mother, such as social and economic conditions, emotional stress, and medical care; (3) biological factors in parents, such as age, parity, medical and reproductive history, and immunologic characteristics; (4) genetic background of parents. To investigate in the offspring: disorders of the nervous system of all products of conception at time of delivery or appearing during infancy or early childhood, including cerebral palsy, mental subnormality, behavioral disorders, etc. A detailed investigation of the independent variables will be directed toward the reevaluation of the effect of factors already suspected, the elucidation of the mechanism through which these factors are operative, and the discovery of factors neither presently known nor suspected.

LONGITUDINAL RESEARCH

Psycho-Physical Development

Wagner H. Bridger, M.D., Associate Professor of Psychiatry, and Beverly Birns, Ph. D., Assistant Professor of Psychology, Albert Einstein College of Medicine, Yeshiva University, N.Y. NIMH

GROWTH OF PSYCHOPHYSIOLOGICAL PATTERNS IN INFANCY

To investigate the origins and course of development of individual differences in neonates. Subjects are normal, healthy full-term babies, two to five days old, born at Bronx Municipal Hospital Center. A neonatal behavioral profile established in prior studies in this laboratory will be used. This profile includes behavioral and heart rate ratings on excitation, soothing, feeding, sleep, and nonstimulus periods of observation. Neonates will be followed at two weeks, one, two, three, and four months of age to measure the stability of early-appearing traits and their relation to later behaviors.

Nancy Bayley, Ph. D., and Dorothy H. Eichorn, Ph. D., Research Psychologists, Institute of Human Development, University of California, Berkeley, Calif.

THE BERKELEY (CALIFORNIA) GROWTH STUDY

A study of the mental and physical growth of normally healthy persons from birth in 1928-1929 to the present. 60 full-term, healthy newborns, born in Berkeley, Calif. hospitals of white, English-speaking parents, if parents were interested--a somewhat selected above-average group; 140 offspring of these subjects, age range from a few months to about 20 years, seen irregularly, but same data (appropriate for age) collected that were collected for their parents. Tests of mental and motor development; pediatric examination; interviews at frequent intervals during growth beginning in first week of life. At all visits, inquiries made concerning current health and recent illnesses. Anthropometrics, body photographs, and skeletal X-rays taken at most ages. Socioeconomic data available. Adult records include mental tests, physical examinations, anthropometrics, and current status interview. Studies of physical aspects of growth include analyses comparing health histories with physical growth and with skeletal maturation. Some parent-child relations in susceptibility to illness are being studied. Emotional and other personality variables studied for consistency, and in various interrelations with maternal behavior in infancy, birth histories, socioeconomic status, intellectual and physical growth. Ongoing since 1928.

Psycho-Physical Development

INSTITUTE OF CHILD WELFARE, UNIVERSITY OF CALIFORNIA

OAKLAND GROWTH STUDY (1932-)

It began as the Adolescence Study in 1932 as a growth study of a group of 215 pupils in the 5th and 6th grade in the public schools of Oakland, California. The program of data collection has involved seriatim records from the 5th through the 12th grade. Series of physical and physiological measurements; motor tests; intelligence and achievement tests were utilized. The study of emotional and social characteristics and interpersonal relationships has constituted a major aspect of the investigation. Records of "free" social behavior were also obtained through various methods.

INSTITUTE OF CHILD WELFARE, UNIVERSITY OF CALIFORNIA

BERKELEY GUIDANCE STUDY (1938-) Jean W. MacFarlane

A group of infants were selected for this study from the birth certificate registry; every third child born in Berkeley, Calif., during an 18 month period (January 1, 1928- June 30, 1929). The project followed the group through childhood and adolescence to age 18 and has seen them at age 30. A wide-range of measurements covering biological, environmental, familial and behavioral aspects of the growing organism, direct measures such as developmental X-rays, body build measures, mental tests and projective tests were used; also interviews furnished materials as seen by parents, teachers, brothers, sisters, the child himself and the professional interviewers. Classmates appraisal was secured by sociometrics and cumulative achievement from yearly school records. The over-all objectives have been (1) to delineate fact of physical, mental and personality growth and development in a normal group and to ascertain the variations among and within individuals at different developmental periods over a long time span; (2) to see the relationships of these findings (a) to the biological facts (b) to environmental facts; (3) to throw light upon critical combination of facts; and (4) to assess how much confidence we should have in the predictive usefullness for the short haul or over the long developmental period of our tools of appraisal of personality characteristics, mental ability, etc., of the child.

Psycho-Physical Development

Ernest M. Ligon, Ph. D., Director, Leona J. Smith, Ph. D., Research Associate, and staff, Union College Character Research Project, Schenectady, N.Y.; and Lilly Endowment, Inc.

METHODS IN CHARACTER DEVELOPMENT

To develop more effective methods in character development in cooperation with families and character-training agencies. (Character is defined in terms of three dimensions: philosophy of values, breadth of social vision, and strength of purpose.) Children and families throughout the United States. These are in churches, YMCA's, and schools, and participate as individual families. The methods of development are based on action research, in which the participants cooperate with the laboratory, using methods of coscientist research. Open-ended reports on research goals constitute the basic body of research data. An analysis of these data serves as the basis for the development of new procedures and for the scientific reports which are published concerning it.

Sylvia Brody, Ph. D., Director, Child Development Research Project, N.Y.; and Sidney Axelrad, D.S.Sc., Dean of Graduate Studies, Queens College, City University of New York, Flushing, N.Y. Grant Foundation.

CHILD DEVELOPMENT RESEARCH PROJECT--A FOLLOW-UP STUDY

To follow through the first year of elementary school the subjects of the Infant Development Project who have been classified as having been subjected to seven types of maternal handling geared to the first year of life, and who differ in developmental quotient and in signs of advancement and disturbance according to the type of maternal handling. Study proposes specifically to ascertain whether and how the type of maternal handling during the first year of life is related to (1) the outcome of such critical periods as weaning, toilet training, and the establishment of sexual identity for the child; (2) the way in which the parents, particularly the mother, handle these critical periods; (3) school adjustment at the end of the first year of elementary school; (4) the intelligence quotient, fantasy life, ability to conceptualize, and degree of psychological conflict in the child through the end of the first year of school. Subjects are 130 white children of intact families, of normal birth, born at Lenox Hill Hospital in New York City; their mothers. Children, and their parents, will be interviewed at ages two , two and one-half, three, four, five, and six, and psychological tests, including Stanford-Binet, WISC, and Children's Apperception Test administered at appropriate ages. At age six, capacity for abstract thinking will be measured, and at each age, there will be an objective assessment of mother-child interaction, using a structured situation. The adjustment of the child in nursery school, if applicable, and during the first year of elementary school will be evaluated.

THE FELS RESEARCH INSTITUTE FOR THE STUDY OF HUMAN DEVELOPMENT

The Fels Research Institute was established in 1929 at Antioch College, Yellow Springs, Ohio under the directorship of Lester W. Sontag. The general purpose of the Institute has been to study human growth and development from the prenatal period to maturity by the longitudinal method of research. A formal program of research was initiated with the purpose of investigating the relationship between I.Q. change and personality structure of the child. With the passage of time, the project was expanded to include other variable of children's total life situations: their changing life situations, their reaction to stresses, the personality dimensions that may be viewed, and the potential for mental and other behaviors which children manifest. The research is based on the study of 140 Fels children who had a relatively complete series of Stanford-Binet Intelligence Tests and other longitudinal records from infancy through at least age 10. There are 89 different families in this group (1958).

HARVARD GRADUATE SCHOOL OF EDUCATION

Harvard Growth Study

Study of growth and development of school children in order to provide both thorough training and the opportunity for experience in research for the students of the Harvard Graduate School of Education, as well as to stimulate further studies of growth and development. In many respects the investigation is a pioneer among longitudinal studies of growth. In the fall and in the early part of the winter of 1922, a battery of mental and scholastic tests, and series of physical measurements were given on approximately 3500 children who had just entered the first grades of the public schools of three cities in the vicinity of Boston. The same or similar tests and measurements were given annually to the same sample population until they graduated from high school or so long as they remained in school.

THE CENTER FOR COGNITIVE STUDIES

Harvard University, Jerome Bruner

Funded by Carnegie Corporation of New York and other foundations and NIMH Center first focused on: psycholinguistics, human memory, perception and cognitive growth of children. Studies begin with infants.

APPENDIX B

FY 70 AND 71 LONGITUDINAL RESEARCH

LONGITUDINAL DESCRIPTIVE STUDIES

Normal physical Development

NICHD Karmel

INFANT PERCEPTUAL AND EVOKED POTENTIAL DEVELOPMENT

Study is designed to determine how human infants three to 24 weeks of age spontaneously handle visually patterned inputs during development.

NICHD

BODY COMPOSITION OF INFANTS AND PRESCHOOL CHILDREN

Includes gathering of data on total body potassium, total body water and creatinine excretion, and changes in these variables from infancy through six years of age.

NICHD

A LONGITUDINAL STUDY OF SKELETAL GROWTH OF PREMATURES

Study proposes to accumulate data to establish distance and velocity curves for growth of subjects weighing less than 2500 grams at birth.

NICHD

SIGNIFICANCE OF VARIATION DURING CHILD GROWTH

Longitudinal study of dento-facial growth and development. 320 children birth to 16 years.

NICHD

PHYSIOLOGY OF GROWTH, NORMAL AND ABNORMAL

Projected work revolves around the influence of rubella on growth of fetal rabbits, the effect of placental insufficiency or hormonal imbalance on fetal macacca mulatta (rhesus monkey) with particular reference to nucleic acids, Zn, Mn, enzymes, proteins, in brain, muscle, liver and myocardium.

NICHD

LONGITUDINAL GROWTH RESEARCH AND DATA ANALYSIS

Reinstitute data collection for a limited group of physical and physiological measurements on the study population of Child Research Council. Data have been collected since 1923 and organized in a computer data system.

NICHD

PREDICTION OF MATURE STATURE

The aim is to provide pediatricians with more reliable tables for predicting mature stature than the current ones.

NICHD

EGG AND SLEEP STATE MATURATION IN INFANTS

Methods of assessing development of the central nervous system in the newborn and young infant using physiological and electroencephalographic data recorded during sleep.

NICHD

THERMAL ENVIRONMENT OF THE NEWBORN

Interrelationships between thermal environment, cold acclimation and growth in small newborn infants.

LONGITUDINAL DESCRIPTIVE STUDIES

Abnormal Physical and Psychological Development

NICHD

HUMAN CHROMOSOMAL DEFECTS - EPIDEMIOLOGY AND ETIOLOGY

On-going study of the occurrence of non-disjunction of the X-Chromosome and of chromosome 21 in consecutive births at two Denver hospitals.

NICHD Fudenberg

IMMUNOLOGY OF CHILDHOOD DISEASES AND AGING

To explore the developmental biology of the immune response beginning in Utero and continuing in neonatal life and childhood.

NIMH Walzer

CHROMOSOME ABNORMALITY AND BEHAVIORAL VARIATION

18 neonates with chromosomal abnormalities, including XXY sex chromosome. To be followed up for behavioral variations.

NICHD Murray

CHROMOSOMAL ABNORMALITIES IN AFRO-AMERICAN INFANTS

Relationship between chromosomal abnormalities and environmental factors, such as seasonal variation, socio-economic status, nutrition. Computerized data will serve to characterize a cohort that will subsequently be used for longitudinal studies of growth and development.

NIMH Mednick

PERINATAL BRAIN DAMAGE AND LATER ANTISOCIAL BEHAVIOR

Longitudinal study of 9000 children whose birth histories were recorded in Copenhagen, Denmark to study interactive relationship between perinatal birth complications, gross social factors and delinquent behavior.

Abnormal Physical and Psychological Development

NIMH Engel

GASTRIC FUNCTION AND PSYCHOLOGICAL PROCESSES

Long term study of two children and two adults with gastric fistulas to study relationship between psychological processes and gastric secretion.

NIMH Witkin

STUDIES OF PSYCHOLOGICAL DIFFERENTIATION

Cognitive style linked with chromosomal anomalies, dream recall and pre-sleep. Psychopathology, autonomic reactivity and verbal cognitive functions. The subjects will be mothers, fathers and infants to three years.

NICHD Bashore

DEVELOPMENTAL BIOLOGY IN MENTAL RETARDATION

Basic investigations into the etiology, pathogenesis and prevention of mental retardation utilizing biomedical techniques.

NICHD

NUTRITION, CELL FUNCTION AND GROWTH RETARDATION

Comparison between fetal malnutrition with post natal malnutrition and the effects of nutrition on some biochemical aspects of growth and development. Cross cultural - Mexico and U.S.

NICHD

THIAMINE METABOLISM IN LOW BIRTH WEIGHT INFANTS

Study designed to evaluate the effect of immaturity with or without associated perinatal disturbance, on the need for thiamine in the neonatal period.

NICHD

RELATIONSHIP OF MATERNAL HYPOXEMIA TO INFANT DEVELOPMENT

Anthropometric measurements and developmental examinations at birth and at stated intervals of infants born to cyanotic mothers.

Abnormal Physical and Psychological Development

NIMH Green, Arthur

SELF-DESTRUCTIVE BEHAVIOR IN ABUSED CHILDREN

Subsequent psychological and self-destructive behavior among boys and girls ages five to eight who have been battered children.

NIMH Kohn

DISTURBANCES IN UNDERPRIVILEGED PRE-SCHOOL CHILDREN

Refine authors scale, obtain scores on group of culturally deprived preschool children, relationship of pathology of five year olds and later achievement during the first grade.

NIMH Freud, Anna

CHILDHOOD PATHOLOGY: IMPACT ON LATER MENTAL HEALTH

Continuation of psychoanalytically oriented method of studying development in childhood as compared to adult neuroses.

NIMH DeMyer

RESEARCH CENTER FOR EARLY CHILDHOOD SCHIZOPHRENIA

Long-range, comprehensive study of autistic or schizophrenic children, including in and outpatients. Therapy includes operant conditioning techniques.

NIMH McNeil

HIGH-RISK STUDY: PROGENY OF PREGNANT SCHIZOPHRENICS

Behavioral, familial, psychophysiological, biochemical study of children born to schizophrenic women in Sweden.

LONGITUDINAL DESCRIPTIVE STUDIES IN COGNITIVE DEVELOPMENT

Sensory Perception and Attention

NIMH

COGNITIVE GROWTH RATES OF INFANT TWINS

Various within-pair and between pair comparisons to reveal influence of genetic makeup, sex, and extra (premature) environmental experience on the development of visual capacities, pattern preferences and visual familiarization effect.

OE/ESEA

PERCEPTUAL CAPACITY OF RETARDED AND NORMAL CHILDREN

Primary objective is the investigation of a possible retardate deficit in basic perceptual capacities relating to identification, discrimination and memory for stimuli which vary along a single dimension and stimuli which vary multidimensionally.

NIMH

SENSORY DISCRIMINATION AND LEARNING IN HUMAN INFANTS

Program to study the sensory and learning capacities of the human newborn, and to document some of these attributes over the first year of life.

OE/ESEA

STUDIES IN SELECTIVE ATTENTION IN CHILDREN

The primary objective of this study is to provide evidence relating to the developmental changes in selective attention. Variables including manipulations designed to affect the complexity of the task and procedural changes will be investigated.

NIMH

TRANSITION FROM SENSORIMOTOR TO VERBAL INTELLIGENCE

Investigator is studying changes in intelligence during the 18 - 36 month period, and also the way in which environmental influences, such as social class, effect intelligence at different periods of development.

LONGITUDINAL DESCRIPTIVE STUDIES IN COGNITIVE DEVELOPMENT

The Development of Language

NIMH

THE ACQUISITION OF SIGN AS A NATIVE LANGUAGE

This study will contribute to our understanding of the speech sample available to the young child learning his native language, and the role of hesitations both in language acquisition and in the comprehension of adult speech by children.

NIMH

HUMAN SPEECH PRODUCTION: ENCODING MECHANISMS AND DEVELOPMENT

The main purpose of this project is to extend existing qualitative models of speech production so as to clarify some of the more complex patterns of organization encountered in natural connected speech of normal adults and children and to approach the problem of how the artidulatory motor-skills of the grown-up are gradually approximated by the child.

NIMH Blank

THE GROWTH OF COGNITIVE ABILITIES IN YOUNG CHILDREN

This project involves a series of studies to assess the level of cognitive functioning in three year old children and the role of language in a child's behavior.

OCD

SOCIAL CLASS AND ABILITY TO COMMUNICATE

Comparison between 150 three and four year olds in Head Start centers with 60 middle class three and four year olds on ability to understand and communicate through imitation and through standard and non-standard English.

NIMH Mehler

CROSS-CULTURAL COGNITIVE STUDIES

Comparison of French and English development of linguistic structure and speech, grammatical and syntactical transformations, auditory and visual perception and psychological coding of words and concepts in children up to 18 months of age.

LONGITUDINAL DESCRIPTIVE STUDIES IN COGNITIVE DEVELOPMENT

Maternal-Child Interaction and Cognitive Development

NIMH Goodrich

MATERNAL STIMULATION AND INFANT COGNITIVE DEVELOPMENT

This project is concerned with the influence of mother-child interactions on Negro infant cognitive development.

OCD Bell

COGNITIVE DEVELOPMENT AND MOTHER-CHILD INTERACTION

Cognitive development and symbolic representation and internalized thought in underprivileged Negro children in first three years of life as related to quality of mother-child relationship.

OE/ESER

THE INTERACTION OF THE ADULT AND THE CHILD IN THE PRESCHOOL SETTING

Development of measures of interactive behavior between mother-child pairs, collection, analysis and reporting of data. Sample of white upper-middle SES and Harlem lower SES.

OEO

MATERNAL BEHAVIOR AND LIFE EXPERIENCES AS THEY AFFECT EDUCATIONAL COMPETENCE OF ONE TO THREE YEAR OLDS

This study hopes to identify some of the environmental factors during the first six years of life which exert major influence over the development, educability and competence in children.

LONGITUDINAL DESCRIPTIVE STUDIES IN COGNITIVE DEVELOPMENT

The Development of Competence and Achievement

NIMH Bruner

STUDIES IN COGNITION

The primary aim of this research is to sutdy the growth of competence in infancy and how this growth can be facilitated.

NIMH

EARLY INTELLIGENCE: EXPERIENTIAL BASIS AND MEASUREMENT

Project will attempt to relate specific measures of the home environment of infants between 12 and 24 months to their intellectual performance and to the degree of change in their intellectual functioning both during and after this time period.

NIMH

THE ANTECEDENTS OF COMPETENCE

Investigation of the influences in an individual's early life which give him self-confidence in his abilities and make him seek proficient performance as a goal. Two year old children and their mothers in Berkeley, California.

OEO

LONGITUDINAL STUDY ON DEVELOPMENT OF COMPETENCE DURING THE FIRST SIX YEARS OF LIFE

The long term goal is to provide information on the role of experience in the development of competence during the first six years of life.

NICHD

ACHIEVEMENT MOTIVES AND THE CHILD'S ENVIRONMENT

Relationship between pupils motivation to achieve, and/or his anxiety about efforts to achieve, and the success of his scholastic performance.

The Development of Competence and Achievement

OE/ESER

PRESCHOOL BEHAVIORAL STYLE AND LATER ACADEMIC ACHIEVEMENT

Investigate relationship between temperament and task orientation in preschool age period and level of academic achievement in elementary school. Middle and upper SES boys and girls in urban settings who have been studied since shortly after birth and are now from six to 12 years of age.

NIMH Crandall

PARENTS' INFLUENCES ON CHILDREN'S ACHIEVEMENT BEHAVIOR

A study of achievement behavior in children and young adults.

NCERD

EDUCATIONAL AND BEHAVIORAL SEQUELAE OF PRENATAL AND PERINATAL CONDITIONS

Objectives are to investigate relationships of conditions of pregnancy, birth, and infancy with school achievement, school placement and school behavior, and to establish instrument and procedures as a prototype for use by 12 participating hospitals. Sample 1240 children whose mothers were participants in the Collaborative Perinatal Research Project, University of Minnesota, to be tested prekindergarten and followed annually thereafter.

LONGITUDINAL DESCRIPTIVE STUDIES IN SOCIO-EMOTIONAL DEVELOPMENT

The Development of Affect and of Self-Control

NIMH Wolff

DEVELOPMENT OF AFFECT EXPRESSIONS IN SMALL CHILDREN

Longitudinal study of the development of affective interchanges of human mother and infant. Observations made in home.

NIMH

DEVELOPMENT OF AFFECT EXPRESSIONS IN SMALL CHILDREN

How certain ways of expressing feelings (crying, smiling) develop in first year of life. Subjects, normal Japanese and American infants, premature infants, and those with organic or functional diseases are studied.

NIMH

EXPERIMENTAL STUDIES OF INTERNALIZATION

Study of process by which children acquire concepts and maintain control over their behavior in order to adapt to social environment. Children five to 11 years old and infants four to 12 months.

NIMH Block

EGO DEVELOPMENT AND THE PROVENANCE OF THOUGHT

Development of ego and of self-control in cross section of children ages three to seven. Thought patterns, cognitive development and environmental factors studied.

NIMH Whiting

THE DEVELOPMENT OF SELF-CONTROL IN CHILDREN

Study is investigating the processes by which a child learns the moral rules of his society in such a way that he will not deviate from the rules.

OE/NCERD/DRDR Ricciuti

ASSESSMENT OF BEHAVIOR IN INFANCY

Project aimed at improving our conceptualization and assessment of salient behavioral and developmental processes in children during the first two to three years of life.

LONGITUDINAL DESCRIPTIVE STUDIES IN SOCIO-EMOTIONAL DEVELOPMENT

Ecological Studies

OCD

ASSESSMENT OF CHILD REARING ENVIRONMENTS

Develop a classification scheme for evaluating and comparing environmental variables in group care and home care settings inhabited by children of preschool age. Primary interest in ecological analysis of the setting and observations of children's modes of utilizing it. 80 children; 40 boys and 40 girls.

NIMH

DETERMINANTS OF CHILDRENS' BEHAVIOR IN PRESCHOOLS

This project will analyze the preschool as an ecological milieu and determine the effects of various preschool subsettings on children's behavior. 40 children between two and five years, representative distribution age, sex and SES levels.

NIMH DeVore

ORGANIZATION AND ADAPTATION OF HUNTER-GATHERER GROUPS

A three year study documenting the total living habits and environment of Bushmen, hunters and gathers. Investigators are specifically interested in population genetics, fertility, settlement patterns, child training and development, interpersonal relations and authority patterns and altered states of consciousness in trance performances.

OE/ESER

STUDIES OF GROUP UPBRINGING

Joint impact of family and peer group on socialization process and its effects in different cultural settings. Four different socializing settings in Israel.

OE/ESER

THE NATURAL HISTORY OF THE EDUCATION OF THE DEPRIVED NEGRO CHILD

Investigation of the process of socialization of the deprived Negro child in the urban ghetto school system. Learning experiences of children in home, school, and peer cultures. Kindergarten through 2nd grade.

INTERVENTION AND TREATMENT

Physical and Psychological

NICHD Pueschel

DOWNS SYNDROME-5 HYDROXY TRYPTOPHAN STUDY

To study the effects of oral 5-Hydroxy-Tryptophan versus placebo on children with Down's syndrome.

NICHD May

BIOCHEMICAL ASPECTS OF ALLERGIC DISORDERS

To study effects of antigen-antibody interactions on biochemical processes.

NICHD Lucey

PHOTOTHERAPY OF NEONATAL JAUNDICE

Object of this research is to better define the benefits and/or risks of phototherapy in the treatment and prevention of neonatal jaundice.

MCHS Lauer

VALIDITY OF 5 YEAR PROPHYLAXIS IN NONCARDIAC RHEUMATICS

Study designed to investigate the validity of discontinuing daily prophylaxis against recurrences of rheumatic fever after five years of prophy laxis have been completed and there is no evidence of residual rheumatic heart disease.

OE

THE EFFECTIVENESS OF LOW FREQUENCY AND AMPLIFICATION AND FILTERED SPEECH TESTING FOR PRESCHOOL DEAF

Comparisons of effectiveness of different types of training with 30 children, ages 21 months to six years.

Physical and Psychological

BEH

ENHANCING THE LONG TERM EFFECTS OF TOKEN REINFORCEMENT PROGRAMS

Follow-up study to determine the stability of effects of reinforcement treatment.

BEH

THERAPY RESEARCH PROGRAM FOR THE SCHOOL AGE CHILD WHO STUTTERS

Attempt to identify appropriate treatment for stutters.

INTERVENTION AND TREATMENT

Early Educational Intervention

Children Under Three

NIMH Gordon

A HOME LEARNING CENTER APPROACH TO EARLY STIMULATION

Infant stimulation program assessing cognitive, language and personality development. Non-professionals work with parents.

NIMH Levenstein

VERBAL INTERACTION PROJECT

Stimulating verbal interaction between mothers and young children through play in home sessions. Follow-up of long-range cognitive gains and the affective impact of the program.

NIMH Healy

MUNDELEIN COLLEGE - HICA EARLY CHILDHOOD EDUCATION PROJECT

Home education program for parents of disadvantaged two and three year olds.

NIMH Gordon

INSTRUCTIONAL STRATEGIES IN INFANT STIMULATION

Curriculum development for children three months to one year. Observe ways in which instruction of infant and mother are carried out by para-professionals as contrasted with professionals, assess relative effectiveness, and whether mothers or teachers behave differently towards male and female infants.

NIMH Hunt

INFANT DEVELOPMENT WITH SPECIAL ENRICHMENTS

Comparison of four strategies in an Iranian orphanage:

1. special enrichments of orphans 0 to two with traditional caretaker regime;
2. mechanical auditory or visual stimulation;
3. one hour a day interaction with untrained high school girl; and
4. one hour a day trained high school girl.

Early Educational Intervention

Children Under Three

NIMH Furlow

INTELLECTUAL STIMULATION OF CULTURALLY DEPRIVED INFANTS

Home tutoring of low income, Negro boys aged two to three years by tutor, one hour a week. Mother involvement. Three year follow-up evaluating intelligence, language development, behavior.

NIMH

MATERNAL STIMULATION AND INFANT COGNITIVE DEVELOPMENT

Study the effects of maternal behavior on infant development and explore ways to successfully advance the child's development during the second year. 60 male, healthy, firstborn Negro infants and their mothers from low income area of New York.

OCD Kessen

CURRICULUM RESEARCH IN INFANT EDUCATION

The goal of this project is to formulate a curriculum with respect to particular developmental systems. Chidlren from one to two and a half years of age will be longitudinally studied in terms of their social, language, and play behavior. The major intention is to develop a program of infant education which will enhance the competence of children from low socio-economic families.

NIMH Kagan

MODEL INFANT CARE COMPONENT

Day care for infants of working mothers with cognitive stimulation and enrichment program.

OCD Lally

DEVELOPMENT OF A DAY CARE CENTER FOR YOUNG CHILDREN

Experiences are provided in a combined home visit and enrichment center program for young children and their families which will foster in the child maximal cognitive and psychosocial functioning during the period of intervention and subsequently throughout life.

Early Educational Intervention

Children Under Three

OCD Gross

FAMILY DEVELOPMENT CENTER

The Family Development Center is designed to provide services for 50 infants from birth to two years and their high school mothers. The objectives of the program are to provide an appropriate day care center for the infants, to assure adequate health care for them, to provide a parent education program for the mothers, and to enable the mothers to continue their high school education.

OCD Caldwell

A SPECIAL FACILITY FOR CHILD DEVELOPMENT AND EDUCATION

Project is a model of the kinds of educational and supportive services to children and families needed to foster optimum development. It includes age-graded educational programs from infancy through sixth grade level; a "community center" type of school for families in a target area; teacher-training program; training program for child care aides; adult education program for nonprofessionals; research program in child development and education; and a comprehensive array of supportive family services, including health, family life education, nutrition, and home management. Current research issues include effects of different types of early intervention on cognitive development between eight and 36 months, strengthening of a language laboratory for three-year-olds, and naturalistic studies of children in a social setting.

OCD Proverce

PROGRAM IN CHILD WELFARE RESEARCH

Study is determining effectiveness of medical, social, educational, and day care services to a group of disadvantaged families, and following the development of this group of children, comparing them with each other and with a control group.

OCD Holmes

A STUDY OF THE IMPACT OF THE PARENT-CHILD CENTERS ON PARENTS AND AN EVALUATION OF THE ADVOCACY PCCS (HEAD START)

The purpose of the evaluation is to describe the program content and organizational characteristics across 32 Parent-Child Centers and to assess the impact of participation on families and children from birth to three years. In addition, the study will include a prospective evaluation of the six Advocacy Parent-Child Centers planned for FY 72.

Early Educational Intervention

Children Under Three

OCD Meeland

PLANNED VARIATIONS

Explores the impact of various curricula on young children from low income families. Initiated in 1969, the first year design is to provide information about implementation of various preschool curricula in the Head Start classroom. Study has two major objectives: to compare short-term and long-term effects of well defined approaches to early childhood education and to assess the cumulative impact of a continuous, systematically coherent program from the preschool years through the early elementary school years. Sample of 2647 children, 1569 experimental and 1078 controls.

NICHD Miller

FOUR PRESCHOOL PROGRAMS: DIMENSIONS AND EFFECTS

Explore the effects of specific treatment variables. Provide information on long-term effectiveness of four kinds of educational programs at prekindergarten level, and obtain information regarding relative effectiveness of various combinations of prekindergarten experiences.

NIMH Kohn

PRESCHOOL PREDICTORS OF SCHOOL ACHIEVEMENT

Study of cognitive, emotional, socio-economic and background variables in predicting future scholastic achievement in preschool children of low- and middle-income. Includes intervention with 250 boys from five year old groups in NYC day care, public and private kindergartens, half white and half black.

Early Educational Intervention

Preschool and School Age Children

OE/ESER

THE CONTRIBUTION OF VERBAL DESCRIPTIONS TO MEMORY FOR PICTURES IN NURSERY SCHOOL CHILDREN

Exploration of ways to improve recognition of pictures among nursery school population.

MCHS

THE GROWTH OF COGNITIVE ABILITIES IN YOUNG CHILDREN

Evaluation of tutorial program for three and four year old disadvantaged children.

NIMH Conant

AN INTEGRATED HOME AND SCHOOL EARLY EDUCATION PROJECT

Study conducted by public school involves low-income, culturally deprived families in education of their infants and young children.

OE/NCERD/DRDR

INSTRUCTIONAL DESIGN AND EVALUATION PROGRAM

Major grant to investigate process of learning and developing neq techniques of instruction, kindergarten through 5th grade.

OE/BESE

LONGITUDINAL EVALUATION OF THE NATIONAL FOLLOW THROUGH PROGRAM

Measurement of the child changes, classroom process descriptions of institutional, community and family change, and description of pupil, teaching staff and program characteristics.

OE/BESE

A STUDY OF READING DISABILITY IN THE U.S., THE OCCURENCE, CAUSES, CHARACTERISTICS, AND RELATIONSHIP TO OTHER ABNORMALITIES

Reading achievement assessment of children sequentially from 1st through 6th grade. 1500 children born between January 1960 and January 1964 to women participating in the Collaborative Perinatal Research Project, University of Oregon, Med. School are being tested from prekindergarten through 6th grade.

INTERVENTION AND TREATMENT

Early Educational Intervention

Preschool and School Age Children

OCD Cisin

A GROUP DAY CARE PROGRAM FOR CULTURALLY DEPRIVED CHILDREN AND PARENTS

This longitudinal study traces the development of a group of disadvantaged children through their formative preschool and early school years to estimate the contribution that might be made through the enrichment of the educational process as well as through social services to the children and their families. The research objective for the present year concerns the testing of the experimental and comparison groups while in the 4th grade.

OCD Shipman

DISADVANTAGED CHILDREN AND THEIR FIRST SCHOOL EXPERIENCE (ETS LONGITUDINAL STUDY) (HEAD START)

A longitudinal study conducted in four sites is recording the development of disadvantaged children from age three and one-half through their first school experiences which may include Head Start and Follow Through as well as regular primary school. The focus of the study in FY 71 was shifted to an evaluation research mode.

SRS

DAY CARE FOR CHILDREN OF MOTHERS IN TRAINING OR EMPLOYED

Training of indigenous staff to operate day care center.

OCD Heinicke

RELATIONSHIP OPPORTUNITIES IN DAY CARE AND THE CHILD'S TASK ORIENTATION

The purpose of this program is to provide model day care for three- and four-year-old children which focuses primarily on improving the quality and quantity of close human relationships available to the young child through the day care program itself and through work with mothers.

Early Educational Intervention

Preschool and School Age Children

OEO

DEVELOP AND COMPARE ALTERNATIVE DESIGNS FOR AN EXAMINATION OF THE EFFECTS OF SELECTED HOUSING PROGRAMS ON CHILD DEVELOPMENT

Study designed to answer questions: do housing programs which vary along certain critical dimensions differ in their long term impact on the child, and does the age of the child participating in the program affect its impact?

OCD Van de Riet

Fourth year evaluation of Learning to Learn school in Jacksonville, Florida. Current year's evaluation will focus on whether the children with two years of preschool will be developmentally superior to those with one year of preschool after each group has completed first grade, and whether the experimental groups are superior to the control groups.

OCD Nimnicht

More extensive evaluation of the process and effects of the Responsive Model Planned Variation program. Study includes information on implementation of Responsive model as well as outcome data.

OCD McCandless

Initial phase of study focuses on recruiting, indoctrinating and teaching caregiving skills to adolescent or young men to work in day care centers. Evaluation of effects of experience on young men, on children of different ages, races and sexes will be explored.

OTHER LONGITUDINAL STUDIES

OCD Shyne

FOLLOW-UP STUDY OF BLACK CHILDREN ADOPTED BY WHITE FAMILIES

Study will evaluate outcome for child and family of 100 black children six years of age or older. Evaluation will include social-emotional adjustment, impact on community, etc.

NIMH Plath

THE CULTURE OF POVERTY IN PUERTO RICO AND NEW YORK

Large scale research project on the culture of poverty of Puerto Rican families in San Juan and New York.

OCD

DEVELOPMENT OF A METHOD FOR REPORTING RESEARCH RELATING TO CHILDREN AT ERIC/ECE

Objectives are to compile an abstract journal of current and recently completed research studies on children and their families, and to evaluate the present form of the abstract journal, Research Relating to Children and to suggest changes in the form of the journal.

APPENDIX C

BACKGROUND, DEVELOPMENT, THEORETICAL FORMULATIONS AND DISCUSSION OF SOME MODELS OF PRESCHOOL INTERVENTION PROGRAMS

(Excerpted from IMPLEMENTATION OF PLANNED VARIATION IN HEAD START, Prepared by Stanford Research Institute, May 1971 for the Office of Child Development, USDHEW, pp. 4-19)

Brief Historical Background of Approaches to Early Education

The traditional source of a child's early education and his socialization has been the home and the family. However, over the centuries, there were those who viewed human development as a continuous process from birth onward, requiring more formal training for optimal development. They spoke of the importance of the earliest years of life and felt that early training was essential to the child's later development. To begin a child's education later, they believed, was to miss a valuable opportunity.

The Development of Nursery Schools and Kindergartens

Among the more recent of these proponents, Comenius (1582-1670) and Froebel (1782-1852) provided the rationale for the nursery school and kindergarten movement that developed in Europe and the United States. Three hundred years ago John Amos Comenius, a Moravian Educator and theologian, wrote a history of early child education in which he proposed that children spend the first six years of their lives in a "School of Infancy." In the early nineteenth century, Fredrich Froebel formulated the bases for present-day kindergartens, which emphasized the natural development of "the whole child," in his classic work, "The Education of Man." By the late nineteenth century, Froebel's work had gained the support of active groups in Europe and the United States. By 1868, a training institute for kindergarten teachers opened in Boston and, a few years later, the first tax-supported public kindergarten opened in St. Louis, Missouri.

Following in the same intellectual tradition, two women, Maria Montessori (1870-1952, and Margaret McMillan (1860-1931), focused their efforts on improving the performance of children of economically poor families by providing an enriched and structured learning environment. Montessori and McMillan can be considered among the progenitors of such

programs as Project Head Start, which reflects our special concerns as a society for our disadvantaged children.

By the 1920s, colleges and universities sponsored child development laboratories and model nursery schools, concentrating on the years between birth and six. The child development theories and practices they generated were employed largely by privately funded nurseries and kindergartens for children of the middle and upper classes.

Day Care for Children of Economically Impoverished Families

Both Maria Montessori and Margaret McMillan rejected the theory, then current, that intelligence was not subject to modification. They developed programs that resulted in the dramatic improvement of the performance of poor children.

Maria Montessori felt that early training of children from the impoverished areas of Italian cities would improve their later school performance and help them become better human beings. She developed special methods of instruction and stressed cooperative social behavior, sensory training, manual skills, and explorative experiences. Despite her efforts to provide an enriched program for poor children, her ideas were adopted largely by middle-class Europeans and Americans. To this day, the Montessori preschool movement continues to grow and these schools bear her name.

In England, humanitarian Margaret McMillan founded the "open-air" nursery in the heart of London for children from two to seven years old and stressed the values of sunshine, fresh air, baths, food, sleep, natural play, and a low ratio of children to teachers. As a result of her efforts and those of Grace Owen, the Fisher Act, which established nursery schools in the English national school system, was passed in 1918.

Overview of Relevant Research

The salient theoretical considerations that underlie such intervention programs as Head Start include the belief in (1) the modifiability and flexibility of human intelligence and human functioning; (2) the significance of the early years of life in a child's development, which may or may not involve "critical periods;"* and (3) the singular

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* A "critical period" refers to the hypothesis that if an organism has not had certain stimuli or experiences by a particular time period, certain responses will be absent from its repertoire.

importance of environmental quality in determining the child's affective and learning modes. However, the dominant view regarding human intelligence that prevailed until very recent times was that it was genetically determined and fixed and that, through a natural process of maturation, it would achieve its predetermined level. But there were early skeptics who tested this view. Among these, the work in the 1930s of the Iowa Child Welfare group (which included Skeels and Skodak) and the study by Dawe (1942), as well as the later work of Kirk and Strodtbeck, are notable examples. Interwoven within the brief descriptions given below of these early studies are the major theoretical formulations that undergird early intervention programs.

Development of Early Education Studies and Theoretical Formulations

The Skeels Study. In a period when intelligence was thought to be genetically determined and not subject to modification, Skeels' (and Dye 1939) classic study and its follow-up (Skeels, 1966) 21 years later represent a dramatic example of the effect of environment on intellectual capacity and on competence. His experimental group consisted of 13 children, aged 19 months and with a mean IQ of 64, who lived in an orphanage. The contrast group of 12 children had a near-normal mean IQ of 87 at seven months of age. The experimental children were moved out of the orphanage to a home for the mentally retarded and cared for by mentally retarded patients. These mentally retarded "mothers" gave them a good deal of affection, attention, and training and took great pride in the children's progress. By contrast, the other group remained in the overcrowded orphanage and received minimal attention from the staff. Two years later the experimental group had gained 28 IQ points and the controls had lost about the same amount. Eleven of the experimentals were placed in adoptive homes. In a follow-up study 21 years later, the two groups still showed dramatic differences: the experimentals had completed a median of 12 years of schooling, with four of them having attended college and one having received his degree, as opposed to a median of only three years of schooling on the part of the contrasts. All experimentals were self-supporting whereas, in the contrast group, four were institutionalized and unemployed and most of the others were employed in menial jobs. Although questions can be raised about the rigor of the experiment, the dramatically divergent results suggest rather strongly the enduring effects of early environmental intervention. Apparently, the warmth, close attention, and care that the mentally retarded women gave the experimental children, coupled with their subsequent placement in foster homes, represented a sustained intervention that resulted in lives of competence and relative autonomy.

Hunt's Theory on Intelligence. In 1961 Hunt's provocative work on "Intelligence and Experience" appeared. Hunt had inferred from the accumulating evidence from both animal and human studies that the development of intelligence is based on the interaction between genetic potential and the nature and quality of environmental circumstance. Hunt (1967b) mentions these studies among others: (1) the work of Johannsen (in 1909) who distinguished between the genotype and phenotype and described the phenotype as a product of genetic endowment and circumstances experienced; (2) animal studies that have revealed that the structural and chemical development of the brain and the animal's learning ability both seem to be affected by the quality of the early environment; (3) human infant studies that appear to reduce the time of appearance of such behaviors as eye-hand coordination and blink-response as the result of a more stimulating environment; (4) the concept of the hierarchical nature of intelligence, as based on the quite different approaches of Piaget (1936) in early child development, of Gagné (1966) on adult problem-solving, and of Ferguson (1954, 1956) and Humphreys (1959, 1962) in factor analysis; and (5) the cross-cultural studies of Wayne Dennis (1966) in 50 settings around the world that seem to demonstrate that life circumstance has a highly significant impact on tested intelligence.

Bloom: The Rate of Development. Benjamin Bloom's (1964) conclusions that the rate of development--particularly intellectual development--is greatest in the early years of life and reaches relative stability by age 12, and that it is most easily modifiable during the period of its most active growth add credence to the belief that early intervention may produce desirable results. This is consistent with Hunt's (1961) earlier observation that a variety of investigations indicate that the longer an organism lives in a given set of circumstances, the harder it is to alter their influence either on its developing anatomy or on its behavorial modes. The issue of "critical periods" in human development has not been established. However, Bloom and Hunt, and Freud before them, appear to agree that there is an "optimal" time of development on many dimensions and that it is in the early years of life.

Hebb: The Effects of the Quantity and Quality of Experience. Hebb's theory (1949) and Freud's work on affective development, as well as the evidence from studies of differential child-rearing patterns between middle-class and lower class families, suggest that the quantity and quality of the child's experiences may affect his cognitive style and response repertoire in an educational setting and in other settings. Hebb's seminal work on "The Organization of Behavior" (1949) advanced the theory that there are two stages of learning: in the first stage the

Dawe's Institutional Training Program. Weikart (1967b) describes another early study in the period when intelligence was considered to be "fixed," which demonstrated the apparent effect of specific language training and enriched experiences on intelligence as measured by the Stanford-Binet. Although the sample was small--a carefully matched group of 22 orphanage children, with an extra child in the experimental group--the results showed a significant 15-point IQ differential between experimentals and controls, with experimentals increasing from 80.6 to 94.8 IQ points and controls losing from 81.5 to 79.5 IQ points. The children had spent a total of 50 hours over a 92-day period, mostly on weekends, in tutoring and small group discussion sessions as well as on excursions. According to Dawe, the children also showed improved language ability that included asking intellectual questions and making critical and analytic remarks.

Kirk's Early Education of the Mentally Retarded. According to Weikart (1967b), it was Kirk's (1958) five-year preschool study of 81 mentally retarded children drawn from institutions and the community that provided the impetus for present-day preschool education. The etiology of the children's mental retardation was due to organic impairment or "cultural deprivation" or both. For one to three years the children in the experimental group were tutored in terms of specially designed individual programs based on a careful diagnosis of their specific mental disabilities. Following this, they entered first grade or special classes in public schools. The immediate impact of this preschool program was an 11.7 IQ rise on the part of the community experimental group. The community control group had increased 6.9 IQ points at the end of the first year of public school. The ability to raise the IQ scores of mentally retarded children added greater credence to the emerging view that intelligence was subject to modification.

Strodtbeck's Reading Readiness Project. Whereas most of the early studies in this country involved mentally retarded or orphaned children, Strodtbeck's (1963) study involved five groups of poor black boys. The treatment for two of the groups was the traditional nursery school approach whereas the program for three groups was somewhat more structured, with emphasis on verbal interaction. There was a small, but clear difference in IQ points for the groups in the more structured treatment over the more permissive groups. Strodtbeck's work represents one of the few early comparative studies (Weikart 1967b).

quantity and quality of an organism's early perceptual experience will determine the amount that is stored in a neurological bank; then, in turn, the second learning stage will depend on the quantity and quality of the bank account for its efficiency and level of operation.

This theory may shed some light on the fact that, although children from economically impoverished backgrounds may be able to function with some competence within their immediate milieu, at school entrance they are not so well equipped in cognitive, verbal, linguistic, perceptual, and attentional skills as their middle-class peers. Also, they seem to require a more adequate self-concept and motivation for learning. To understand the apparent divergence between middle-class and lower class children, a number of investigators have conducted comparative studies of child-rearing patterns between classes and among racial and ethnic groups. These include studies of English families by Bernstein (1960, 1961); of Israelis by Smilanski (1961, 1964); of blacks by Davis (1948 and with Havighurst, 1946) and by Hess and Shipman (1965, 1969); and of Puerto Ricans by Lewis (1966). Regardless of the cultural variations, these investigators have found distinct differences in child-rearing patterns between socioeconomic classes. The findings from all these studies have suggested that appropriate compensatory education programs may prevent or ameliorate many of the conditions that appear to hamper the children's competence. As a result, investigators have mounted intervention studies to test the effectiveness of their various approaches, either independently or under Head Start sponsorship.

Enriched Nursery Curricula with Cognitive and Language Components. In the late 1950s these findings may have contributed to the independent decisions of several investigators in three separate geographical locations to begin plans for a new generation of experimental studies targeted to the economically and educationally disadvantaged. Meanwhile, Hunt's work had appeared, as well as the findings of other investigators (see above) that added theoretical weight to the cogency of the effort. By 1962 the projects were operational and included: Gray and Klaus' Early Training Project, DARCEE (1965), in Murfreesboro, Tennessee, for black children; Deutsch's Preschool and Early Elementary Education Project, IDS (1965), for a largely black population in New York City; and Weikart's Perry Preschool Project (1964) in Ypsilanti, Michigan, for black children diagnosed as mentally retarded because of "cultural deprivation."

The three projects used differing but carefully designed nursery school programs, with the addition of structured language and cognitive development components as important elements in the programs. The Gray and Klaus program also included home visits and the Weikart program

entailed home teaching once a week. The three programs reported significantly higher IQ scores for the experimental groups over controls and the DARCEE and Weikart programs indicated higher initial achievement results as well.

These studies provided early and clear evidence that improved functioning can obtain from carefully designed programs with language and cognitive components. According to Weikart (1967b), other investigators who explored cognitive development in early childhood education during this same period include Kugel (1963); Fouracre (1958); Moore and Anderson (1960a, 1960b, 1960c); Fowler (1962); and Blatt (1962).

Operation Head Start

In 1963, President Kennedy's Panel on Mental Retardation proposed a national program of intervention to prevent mild retardation traceable to impoverished circumstances. A large number of children coming from the lowest socioeconomic groups were known to be educationally handicapped because of poor health care and inadequate learning experiences in early life.

Subsequently, a panel of experts headed by Dr. Robert Cooke, Pediatrician-in-Chief of Johns Hopkins Hospital, drafted a detailed report proposing a child development program for the 5.8 million children under six years of age who were living in poverty. This report, delivered in February 1965, became the springboard for Head Start and included the following objectives:

- Improving the child's physical health and physical abilities.
- Helping the emotional and social development of the child by encouraging self-confidence, spontaneity, curiosity, and self-discipline.
- Establishing patterns and expectations of success for the child that will create a climate of confidence for his future learning efforts.
- Increasing the child's capacity to relate positively to family members and others while strengthening the family's ability to relate positively to the child and his problems.

- Developing in the child and his family a responsible attitude toward society and fostering constructive opportunities for society to work together with the poor in solving their problems.

- Increasing the sense of dignity and self-worth within the child and his family.

Since Head Start is simultaneously both a massive social experiment and a social action program, it is highly visible and subject to frequent review for its effectiveness. Grotberg (1969, pp 2,3) discusses the issues and problems involved in providing early definitive answers as to the program's effectiveness.

> "In any experiment, the first observations of experimental consequences do not afford an over-simplified choice between abandoning the experiment as a failure or perpetuating it rigidly as a success. Instead, discoveries serve to redirect efforts along alternative routes, to focus attention in new directions, to generate new ideas for further experimentation. Further, it would be unreasonable to expect immediate definitive answers about program alternatives and their success, since these answers must necessarily be preceded by investigations which establish the major dimensions of variation in people, programs, and consequences which need to be evaluated. Since more than forty years of research related to these basic questions have still not produced definitive answers (Hunt, 1961; Fuller, 1960; Sears and Dowley, 1963; Swift, 1964; and others), Head Start's research program cannot be expected to provide answers in just a few years. But there are several particular difficulties associated with the conduct of research on early childhood development and education which legitimately account for this relatively slow rate of progression. Some are essentially conceptual problems, associated with formulating clear ideas and theory and learning to ask the proper questions for research investigation. Others are methodological problems, associated with difficulties in measuring attributes of very young children and programs which deal with them. A third category of research difficulties might be labeled logistical problems, in that ideally planned investigations are often not feasible with 'real' children, 'real' families, and 'real' educational programs. And, finally, in any kind of research there are interpretational problems which stem from the fact that data are not always unequivocal, and observations usually permit several alternative interpretations."

Despite these difficulties, Head Start research and evaluation has proceeded to initiate, promote, and fund: (1) surveys through the Census Bureau in a representative sample of Centers, primarily to determine the extent of compliance with Head Start guidelines; (2) research studies for development of measuring instruments, on pilot and demonstration projects, on various aspects of child development, and on methodology for translating pilot and demonstration projects to the field; (3) national evaluation studies (beginning with the first summer program in 1965) to assess a variety of programmatic approaches to determine the bases for the observed changes on participating children and their families; and (4) a longitudinal study, still in process, of a sample of children three-and-one-half years through the third school grade in four geographic areas (Datta, 1969).

Many studies of summer Head Start programs showed that the children had achieved a significant increase on ability measures but typically were not up to national norms. Investigators (Jensen and Kohlberg, 1966; Beller, 1967; Bittner and Rockwell, 1968; Nalbandian, 1968) reported the full-year programs also showed a significant increase but were still below national averages; whereas Alexander (1968) and Faust (1968) found that in the 1967-68 programs, the children reached the national average on the Stanford-Binet. Preliminary data from national studies also showed an elevation from an average IQ score of 86 during the first two weeks of Head Start to an average IQ score of 103 (Datta, 1969) after about 40-weeks experience in the program.

There was some evidence that Head Start children also showed changes in attitudes, motivation, and social behavior (as based on teacher ratings) and more socially appropriate behavior in a variety of situations (Datta, 1969).

Specialized Preschool Curricula

Bereiter and Englemann's Academically Oriented Preschool. Noting that children of low income families, especially black children, lacked many of the school-valued skills common to middle-class children, Bereiter and Englemann (1966) structured a preschool program with clearly specified goals and curricula specifically designed to goal achievement. The task-oriented curricula consisted of training in linguistic and numerical skills, using verbal instruction, imitation, and reinforcement. Fifteen 4-year-old children from black, "culturally deprived" homes spent 20 minutes each day learning each subject by rote and then applying the knowledge in analogous situations of increasing difficulty.

The children showed gains on the Stanford-Binet Scale that brought their IQs from the low 90s to over 100. They had been 18 months below average on the ITPA at the beginning of the program, but by the end of the second year the whole group was approximately up to average. However, the children were not up to the level of middle-class children in the logical use of language. After the preschool year the children's reading scores were at the beginning of first-grade level and the arithmetic scores were at the beginning of second-grade level. By the end of kindergarten the reading scores were at mid-first-grade level on the average and the arithmetic score was at mid-second-grade level.

The key sentence in the last paragraph relates to the fact that the children were below middle-class children in their ability to use language in a logical way. This raises the issue as to whether skill training alone allows the child to comprehend and understand what he has been taught in a sufficiently broad way to be able to apply it flexibly and appropriately. This breadth may become more critical as the child advances through the grades.

Bushell: Behavior Analysis Program and Risley: Reinforcement Contingency Program. Both Bushell and Risley successfully employ Skinnerian behavior modification or operant conditioning techniques to elicit desired behavioral objectives. This is a unique approach to preschool education.

Bushell uses systematic reinforcement procedures to teach children the academic skills of language, reading, writing, and arithmetic, as well as the appropriate social skills. Appropriate behavior is rewarded immediately with tokens and praise. The earned tokens can be used by the child to "purchase" snacks and art and for stories, recess, and the like. The amount of tokens given out also serves to check the teacher's behavior because, if the child has received too few tokens, she must reexamine her teaching to discover the reason. Parents are also used as behavior modifiers (Maccoby & Zellner, in press).

Risley uses operant reinforcement techniques in his preschool language training program. The 15 black children receive verbal and food reinforcement. There was a substantial rise in correct responses when the children learned that they could obtain preschool materials only if they respond correctly. When the contingencies were removed, there was a drop in correct responses but they remained substantially above previous levels (Parker, 1970).

Sprigle: Learning to Learn. Much of Sprigle's approach to early education is derived from Piagetian concepts and their extensions by Inhelder and Flavell. Assuming sequential cognitive development--from motor to perceptual to symbolic--Sprigle (Parker, 1970) feels that as the child proceeds through these stages, he perceives relationships between his actions and his experiences and thus becomes aware of the objects in his world. In this way he learns how to learn. Sprigle has conducted studies with four- and five-year-old children, both from lower and lower middle socioeconomic class families. Five groups of children were involved in the study: two experimental groups of lower and lower middle socioeconomic class children, two groups that had the traditional nursery school curriculum, and one group that had no preschool experience. The four groups with preschool experience achieved ability scores at national norms or slightly above, with the lower middle socioeconomic group being somewhat higher, whereas the no-preschool group was well below national norms (83 IQ) (Parker, 1970).

Various Curricula Approaches. Additional approaches are being studied by different investigators. Among these are the EDC "discovery" approach, whose prototype is the British Infant School, and the Bank Street School, which is concerned with many dimensions of the child's development. Bank Street's "discovery" model includes infusion of symbolic skills in real life situations as important aspects of the child's learning environment. Both these programs provide a rich environment with committed and involved teachers who help the child in his multifaceted development (Maccoby and Zellner, in press).

Nimnicht, McAfee, and Meier use an eclectic approach based on Montessori, Deutsch, and O. K. Moore. They stress intellectual development and a positive self-image as essential goals. Programs by Karnes, Hodgins, and Teska use a highly structured psycholinguistic approach with "culturally deprived" children. Palmer, Robison, and Sapon all use language and cognitive components. Hodges, McCandless, and Spiker developed a structured, diagnostically based kindergarten curriculum in an effort to increase the intellectual, language, motor, and socioemotional abilities of their 82 Appalachian children (Parker, 1970).

Comparative Studies Implemented

With the increasing proliferation of approaches to early education, it became apparent that studies should be mounted to compare their effectiveness. As a result, several groups began comparing three to five distinct approaches in 1967-68. The principal investigators of these comparative studies include Weikart, Karnes, Miller and Di Lorenzo.

Immediate Impact of Early Education Studies

A quick review of Table 1's column labeled "Program Effects" and the "Immediate Impact" column of Table 2 provides a rather clear picture of the available results on these selected programs. In almost every case, and rather dramatically in some of of them (e.g., Weikart), there is improvement of the experimental groups over the contrast groups. In some cases, the contrast groups have also improved (Weikart, Wave 0 and Wave II; Karnes et al.) but other contrast groups have lost ground (Dawe, Kirk, Strodtbeck, Deutsch, DARCEE, Weikart). The "Achievement and/or Other Gains" column of Table 2 also indicates improvements (Head Start, DARCEE, Weikart, Sprigle, Bereiter-Englemann). Thus, the immediate impact of the programs lives up to the hopes of the many dedicated people involved, both participants and workers.

Long-Term Effects

However, it is also clear that over time these early gains are not maintained in most of the studies that have retested their groups at a later time. This has not been invariably true. The DARCEE (Gray and Klaus, 1970) experimental groups maintained a significant difference* in IQ scores over central groups even through the fourth grade--seven years after the beginning of their preschool experience. Weikart (1966a) also found that Wave 0 maintained its gains on the California Achievement Test and the Gates Reading Test at the end of the first grade. For many of the Head Start programs, however, upon school entrance, the accelerated rate of development is not sustained. By the end of the first year of school, the non-Head Start children equal Head Start children (Datta, 1969).

As explanations of these results, it is possible to differentiate three phenomena: a "leveling" effect, a "catch-up" effect, and a "fade-out" effect. The leveling phenomenon seems to describe the fact that the rate of gain evident in the initial spurt of the children in the experimental preschool programs "levels" off or does not continue its accelerated course. The catch up phenomenon describes the fact that by the end of the first year of public school (whether in kindergarten or in first grade), children without preschool experience also seem to have an "initial spurt" by which they appear to be "catching up" with the children with preschool experience. Usually both these phenomena are occurring

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* This was true despite the fact that the pattern of IQ scores of all groups appeared to peak over time and then decline.

Table 1

MORE RECENT RESEARCH DEVELOPMENTS IN EARLY EDUCATION*
(Selected Programs)

Investigator or Program	Study Group	Programmatic Focus	Program Effects: Experimental Group IQ	Program Effects: Contrast Group IQ
Skeels: 1939, 1960	Mentally retarded infants	Radical and sustained intervention	102 (after 2 yrs)	66 (after 2 yrs)
Dawe: 1942	Twenty-three orphanage children	Fifty hours language tutoring and excursions	80.6 to 94.8†	81.5 to 79.5
Kirk: 1958 Community group	Mentally retarded	Language intervention	72.5 to 83.7	75.8 to 75.2
Institutionalized group			61.0 to 73.0	57.1 to 49.9
Strodtbeck: 1958	Low income children‡	13-week Reading Readiness		
		Structured curriculum	94.3‡	89.0‡
		Permissive curriculum	86.0‡	85.0
Deutsch: 1962	Low income	Enrichment nursery (innovations)	98.9 to 103.9†	99.0 to 92.0
DARCEE: 1962	Low income	Enrichment-parent education	88.5 to 95.5†	86.7 to 81.7
Weikart:				
Wave 0: 1962-63	Low income and mentally retarded	Cognitive (Piaget)	78.4 to 91.1†	75.0 to 82.2
Wave I: 1962-63			79.1 to 90.6†	78.3 to 77.8
Wave II: 1963-64			80.5 to 100.9†	79.4 to 82.9
Wave III: 1964-65			79.6 to 94.4†	81.0 to 81.2
Head Start: 1965 on	Largely low income			
Summer		Began as enrichment nursery	Improved but below norms	
Full year		Multiple approaches	Improved but below norms in most cases	
Bereiter-Englemann: 1964	Low income	Prescripted language development	low 90s to over 100	No control group
Risley: 1966	Low income	Behavior modification	Improved	No data
Sprigle: 1965	Low income and lower middle income	Learning to learn	104 to 112	Traditional group 90 to 107 No Preschool 83
Educational Development Center	Low income	Discovery	Data unavailable	
Bank Street School	Low income	Discovery	Data unavailable	
Karnes, Teska, Hodgins	Low income	Psycholinguistic	96.0 to 110.3	94.5 to 102.6

* Sources of information on which the table is based are found in the text, along with name of investigator or program.

† Observed difference between groups is significant.

‡ Children tested three months before preschool as own controls.

Table 2

IMMEDIATE IMPACT AND LONG-TERM EFFECTS OF SELECTED EARLY CHILDHOOD PROGRAMS, BY PROGRAMMATIC FOCUS*

Program Focus (investigator or program title)	Immediate Impact		Long-Term Impact	
	IQ	Achievement and/or other gains	IQ	Achievement and/or other gains
Head Start (variety of programs: Deutsch type)				
Summer	Improved† (below norm)	Improved	Most faded	Improved‡
Full year	Average†		Most faded	
General Enrichment (Deutsch)	Average†	n.a.	n.a.	n.a.
(DARCEE)	Average†	Average*	Seven years later. Significant difference between groups†	Some faded§
Cognitive (Weikart: Waves 0, 1, 2, 3, 4)	Average†	Significant improvement	Average (Waves II, III)†	Maintained gains (Wave 0)
Diagnostic (Hodges, McCandless, Spiker)	Average†		Average	
Ameliorative (Karnes)	Average†		No significant difference	
Learning-to-Learn (Sprigle)	Above average	Generally above average	Above average§	Significant difference§
Language (Bereiter-Englemann) 1966	Above average†	Above average†	No data	No data
Behavior Modification (Risley)	Improved	Significant improvement§	n.a.	n.a.

* Sources of information for table are found in text along with the name of the relevant investigator or program.

† Difference between experimental and contrast groups is significant.

‡ Source: Weikart (1967); Grotberg (1969).

§ Information received from telephone conversation with investigator.

n.a. = not available.

simultaneously: the experimental group is leveling off while the contrast group is catching up. Therefore, the initial spurt of the group without preschool experience is not as high as that achieved by the experimental children--rather the slope of the curve is flatter and the final level reached is typically not high.

Whereas the leveling-off phenomenon describes a slowing of the rate of gain of the experimental children after their first year in public school and the catch-up phenomenon describes the initial spurt of the control children after their first year of public school experience, the fade-out phenomenon describes an actual loss of gain or a deterioration in IQ or achievement scores. The fade-out phenomenon has only been evident in longitudinal studies that tested the children at the end of second or third or even fourth grade.

On the basis of the study results, it is also possible to distinguish the effects of the different phenomena on IQ and academic achievement. Typically, though not invariably, catch-up occurs in both IQ and achievement scores. Again typically, but not invariably, leveling-off occurs in academic achievement whereas fade-out occurs in IQ levels.

A number of explanations have been suggested for the catch-up or leveling-off phenomena. Datta (1969) summarizes them essentially as follows:

- One-time impact. This explanation suggests that a new environment stimulates children to improve no matter whether they first experienced the stimulation in Head Start, kindergarten, or first grade.

- Class norms. The teacher tends to concentrate on the less advanced members of the class, e.g., the non-Head Start students, in order that the whole class may progress. This suggestion is supported by a finding in one study (Wolff and Stein, 1967) that gains are maintained when 50% or more of the class attended Head Start, whereas the gains disappear when 20% or less are Head Start graduates.

- Peer group influence. This may proceed in either of two directions: Head Start children may stimulate the non-Head Start children or Head Start children may relax as they find themselves more advanced and not continue to perform at elevated levels (the Wolff and Stein findings may be applicable in this explanation also).

- Learning cycles. This suggestion assumes that learning occurs in spurts, followed by plateaus, and that therefore the non-Head Start children are in their "one time, any time" growth spurt wherever the Head Start children are in a plateau period.

- Factors in the school system. This suggestion includes the idea that the teacher may not have sufficient time and energy to meet the Head Start child's needs when she has 30 children in her class. Another possibility is that the curriculum may not be sufficiently articulated to the child's Head Start experience or to his developmental needs.

Any of these or other explanations are plausible, but none have been supported by systematic evidence. At present, it appears that there is an immediate impact of Head Start on the children's development. What the factors are that cause the impact, whether the gains can be maintained, whether there is a natural pattern of fluctuation in developmental processes, and which programmatic strategies will both promote and sustain developmental gains are questions that remain unanswered. The Head Start PV Program, which is described in detail in the next chapter, has been developed to promote understandings that may help us to achieve our goal of providing to each child the resources that will contribute to his optimal development.

APPENDIX D

SOME MAJOR EXPERIMENTAL INTERVENTION STUDIES IN PRESCHOOL EDUCATION

Bell, Silvia	Johns Hopkins University
Beller, Kuno	University of Pennsylvania
Bereiter, Carl and Engelman, S.	University of Illinois
Caldwell, Bettye	University of Arkansas
Deutsch, Martin and Cynthia	New York City
Emlen, Arthur	University of Oregon
Gallager, James	Chapel Hill, North Carolina
Gilkeson, Elizabeth	Banks St. College of Education, New York
Gordon, Ira	University of Florida, Jacksonville
Gray, Susan and Klaus, Ruper	Peabody College
Heber, Rick	Milwaukee
Heinicke, Christopher	Reiss-Davis Study Center, L.A.
Herzog, Elizabeth	Howard University Study
Hunt, J. McVicker	University of Illinois
Kagan, Marion	Honolulu
Karnes, Merle	University of Illinois
Keister, Mary Elizabeth	University of North Carolina, Greensboro
Kirk, Sam	University of Illinois
Kohler, Mary	Nat. Com. Resources for Youth, NYC
Lally, Ron	Syracuse University
Levenstein, Phyllis	Mineola, New York
McCandless, Boyd	Emory University
Nimnicht, Glen	Berkeley, California
Palmer, Frank	Harlem
Prescott, Elizabeth	Pacific Oakes College, L.A.
Provance, Sally	Yale University
Sale, June	Pacific Oakes College, L.A.
Schaefer, Earl	Tutoring Project, Wash. D.C.
Shipman, Virginia	E.T.S., Princeton
Sigel, Irving	Study done at Merrill-Palmer Inst.
Sprigle, Herbert	Learning to Learn School, Florida
Sulzer, Jefferson, Hansche, Wesley	Early Childhood Research Center, Tulane University
Weikart, Dave	Ypsilanti Preschool Project

LONGITUDINAL RESEARCH

Preschool

Intervention Programs

REGIONAL RESEARCH AND RESOURCES CENTER IN EARLY CHILDHOOD
Deutsch, Martin, et. al.

Monitored progress of experimental and control children for five year period of administering standardized and institute developed tests and observational procedures. Instruments include Stanford-Binet, form LM, the Peabody Picture Vocabulary test, the Illinois test of Psycho-linguistic Abilities, the Lorge-Thorndike Intelligence Tests and the Metropolitan Achievement Tests.

Experimental children scored significantly higher on most measures than controls. Though some cumulative deficit effect is apparent for almost all of the treatment waves from the end of kindergarten through 3rd grade, the experimental children are not far from national norms, while controls are far below.

Subjects

Experimental and controls were black children, ages four to nine in a northern urban ghetto. Waves of children admitted each fall to pre-kindergarten and followed through enrichment program. First wave admitted 1/63 has now completed five years of enrichment (grade three).

THERAPEUTIC INTERVENTIONS WITH EMOTIONALLY-DISTURBED PRESCHOOL CHILDREN
Stern, Carolyn, Nummedal, Susan, and Burssell, Sadelle
Funded by OEO. Early Childhood Research Center, University of California, Los Angeles. March 1971 Mimeo Paper

Two experiments conducted. In Experiment I three methods of dealing with identified emotionally-disturbed children were compared simultaneously "testing the hypothesis that community personnel can be taught to work effectively with such children." Experiment II examined the question of differences and similarities in types of problem behavior as related to socio-economic and ethnic variables. Study conducted in therapeutic Head Start Classes. A total of 68 children screened, 42 identified as disturbed.

Study I concluded that paraprofessional aides recruited from the community could be trained to work with disturbed children, and that no differences were found in the three types of treatments compared, though overall effects were positive.

The second experiment found no socio-economic or ethnic differences in the measures used.

Preschool

Intervention Program

LEARNING TO LEARN PROGRAM
Herbert Sprigle, Joan Sprigle

"A Fresh Approach to Early Childhood Education and a Study of its Effectiveness"

Evaluation Directors: Van De Riet, Vernon and Hani

Prior evaluation of experimental group in Learning to Learn Program, two comparison groups, one in traditional kindergarten, one in intervention.

This project conducted with 23 children of lower-middle socio-economic class families whose parents had a HS education or less, were blue or white color workers with annual income of $6400. Lower socio-economic families excluded. Pre- post comparisons of one year program indicate that the experimental group made significant gains on Binet, School Readiness Screening Test, ITPA Vocal encoding and ITPA Auditory-vocal Association.

SELECTED EVALUATIONS OF AN APPROACH TO EARLY CHILDHOOD EDUCATION
McAffe
New Nursery School, College of Education
University of Northern Colorado, Greeley, Colorado
Paper presented at the Hyman Blumberg Memorial Symposium on Research in Early Childhood Education, February 1-3, 1971

Sample 30 children ages 3, 4, and 5 in prekindergarten, 25 are M.A., 2 black, 3 white. Children given the Caldwell-Soule Preschool Inventory - 1967 and the Wechsler Preschool and Primary Scale of Intelligence.

Study includes longitudinal follow-up of five groups of children who have been through the preschool program and are now in public school to school. Teachers ratings give slight edge to experimental group. Experimental group show some gains in I.Q. as a result of the preschool experience.

DEMONSTRATION AND TRAINING PROJECT FOR MIGRANT CHILDREN
Southwest Educational Development Laboratory, Final Evaluation Report to OEO and OCD, July 1970

Project has three major components: to develop instructional materials, staff development and parent-school-community involvement. 90 children 3, 4 and 5 year old migrant, Mexican-American and controls. Includes both formative and summative evaluations. Summative evaluation, utilizing Carrow Auditory Test for Language Comprehension, Boehm Test of Basic Concepts, and Raven Progressive Matrices.

Preschool

Intervention Programs

MOBILE HEAD START PROGRAM FOR MIGRANT CHILDREN AND PARENTS
Final Report and Strategies for Continuation Activities, Nov. 1, 1970-
OEO and Teacher Corps. Prepared by the Southwest Educational Development Laboratory

18 month grant which attempted to develop project to follow specific students and provide educational intervention with migrant families. Study found that migrants do not travel in sufficiently large cohesive groups for continuing educational intervention. Made six principal recommendations for future programs which included:

1. Financing a system for mobile schools which would follow the migrant stream concentrations.
2. Continuation of the early childhood development and parental involvement programs at the McAllen Demonstration and Training Center, McAllen, Texas.
3. Financial provision for modification of elementary materials for grade.
4. Supplemental financing for all, or selected parts, of comprehensive, long range program for development of secondary education for migrant pupils.
5. Development of parent education curriculum.
6. Peer tutors en trek for migrant students by the employment of settled out school-age former migrants.

Beller, E.K. Progress Report, OEO, March 1971

A study on the effect of child-centered, adult-centered, and material-oriented educational programs on the socio-emotional and cognitive development of preschool children. Survey of 50 classrooms of pre-school children was unable to identify any child centered, low structured programs for lower class children. Beller reports that though they were able to identify nurturant Head Start teachers, all offered highly structured or controlling programs. Because of this, study was modified to include a smaple of nurturant-structured nurseries for middle and lower class children.

Environments for middle and lower class children include:
Montessori (material Oriented)
Low Nurturance; High Structure - Adult Oriented
High Nurturance, High Structure - Adult and Child Oriented
for Middle class children only
High Nurturance, Low Structure

Measures: Interpersonal - two experimental situations
Impulse control: Draw-A-Line Slowly and Walk-A-Line tests and Kagan Reflective Impulsive test
Self concept: Borwn Test and Goodenough Draw-a-Person
Cognitive: Peabody Picture Vocabulary
Banter Dog and Bone test
Kagan's Reflective Impulse and Coates Embedded Figure Test

Preschool

Intervention Program

EARLY CHILDHOOD RESEARCH CENTER
Sulzer, Jefferson, Ph. D., Hansche, Wesley J., Ph. D., and Koenig, Fredrick
Koenig, Fredrick, Ph. D.

NUTRITIONAL AND BEHAVIORAL EVALUATION OF CHILDREN IN METROPOLITAN NEW ORLEANS

A one year report on a study of the relationship between nutrition status and behavior,and the effectiveness of dietary intervention upon nutrition and behavior measures. Sample: kindergarten classes of six schools assigned to three groups: those receiving both breakfast and lunch at school, those receiving only lunch at school, and a control which received a morning snack. (Total sample/pre-post: Behavioral 341 Biochem 406. Pre and post behavioral and nutritional measures obtained.)
Findings: Study failed to replicate earlier findings that children with low HB (less than 10.5 gm/100 ml.) had significantly lower mean I.Q.s. On the Kahn Intelligence Test I.Q. increased by two points for the breakfast-lunch group, one point for the lunch only group, and declined slightly for control group. Though not statistically significant, positive gains in speed of associative training were found with dietary intervention group.

Title of program: Children's Center

Location of program: Syracuse, New York

Principal investigator: Bettye Caldwell and Julius Richmond

Administering agent: Syracuse University

Date of program termination: In July, 1969 there was a change in principal investigator and program changes occured (see Appendix B, page 3).

Characteristics of children in program

Age range: Originally, 6 - 36 months; later, through 4 years of age

Socio-economic level: Originally, primarily low; later also included upper middle and middle

Ethnicity: Mixed, black and white

Children-to-teacher ratio: Children under 3 years old: 4:1
Children 3 years old: 6:1
Children 4 years old: 7:1

Services

Education: Originally, full day for all; later, two-thirds on a full day basis, one-third on a half day basis

Nutrition: Meals served at the Center

Health: Provision of an isolation room for children with minor illnesses. One staff pediatrician, half time. Three second-year pediatric residents who see the children in the longitudinal child development study regularly on a weekly basis (only part of the children are involved in the study). Four staff nurses, two functioning as nurse-teachers, one a public health nurse making home visits, and one supervising the daily health concerns of the children.

Social Services: Social casework as needed with the families

Parent involvement: Parents had monthly conferences with the staff and were encouraged to serve as volunteers in the classroom.

Measurement and evaluation variables: Parental ideas concerning how children learn, the strength of attachment between mother and child, developmental level and learning style of infants and children, stimulation potential of the home

Follow-up: Testing until children are 7 years old

Title of program: Center for Early Development and Education

Location of program: Little Rock, Arkansas

Principal investigator: Bettye Caldwell

Administering agent: University of Arkansas

Dates of program initiation and termination: October, 1969 - on-going

Characteristics of children in program
- Age range: Infancy (from 6 months on) through sixth grade
- Socio-economic level: Lower, lower middle
- Ethnicity: Mixed, white and black

Children-to-teacher ratio: Children 6 months - 3 years: about 4:1
Children 3 - 5 years: about 5:1

Services
- Education: Full day program for all age groups. Includes an elementary school program which focuses on team teaching, individual tutoring of children according to pre-diagnostic needs, and stimulation in a "Learning Library".
- Nutrition: Breakfast to some children, lunch and two snacks to all children.
- Health: Physical exams given by University of Arkansas Department of Pediatrics. Medical referrals made to appropriate agencies. Clinic held at school one afternoon per week, which includes medical and dental exams, treatment, and follow-up.
- Social Services: Extensive support services provided, including home visits, referrals, and clothing sales.

Parent involvement: Community Advisory Council had an open house for the families. Parent meetings dealing with safety.

Measurement and evaluation instruments or variables:
Stanford-Binet, Wechsler Preschool and Primary Scale of Intelligence subtests, Peabody Picture Vocabulary Test, Illinois Test of Psycholinguistic Abilities, Beery Developmental Test of Visual-Motor Integration, Metropolitan Readiness Test, Metropolitan Achievement Test, Iowa Tests of Basic Data subtests, level of home stimulation.

Title of program: Children's Center

Location of program: Syracuse, New York

Principal investigator: J. Ronald Lally

Administering agent: Syracuse Universtiy

Dates of program initiation and termination: July, 1969 - on-going

Characteristics of children in program
- Age range: 6 - 36 months
- Socio-economic level: low
- Ethnicity: Mixed, black and white
- Special characteristics: Only first or second born children

Children-to-teacher ratio: Approximately 7:1

Services
- Education: Home visit, one per week. Center program: 6 - 15 months of age, half day; 15 - 36 months of age, full day.
- Nutrition: Meals served at the Center. Information on nutrition included in home visits.
- Health; Liaison with community services
- Social services: Liaison with community services

Parent involvement: Participation in day care activities, toy and clothes workshops, training, lunches, meetings, one home visit per week

Measurement and evaluation instruments or variables:
Cattell, Stanford-Binet, Wechsler Adult Intelligence Scale, Early Language Assessment Scale, Illinois Test of Psycholinguistic Abilities, Peabody Picture Vocabulary Test, Piaget Sensori-Motor Test, Boehm Test of Basic Concepts, Caldwell-Soule Preschool Inventory, Preschool Attainment Record, Children's Self-Social Construct Test, Implicit Parental Learning Theory Scale. Also information on home stimulation, affective development, demography, and diet, plus weekly home visit reports.

Follow-up
- Services: Continuing program with attempt to integrate all the child's experiences at home, in Children's Center and at school
- Testing: Developmental testing and public school tests each year, Kindergarten through fourth grade

Title of program: Demonstration Project, Group Care of Infants

Location of program: Greensboro, North Carolina

Principal investigator: Mary Elizabeth Keister

Administering agent: University of North Carolina, Greensboro

Dates of program initiation and termination: January, 1967 - on-going

Characteristics of children in program
- Age range: 3 months through 3 years
- Socio-economic level: Mixed
- Ethnicity: Mixed

Children-to-teacher ratio:
- Children under 18 months of age: 5:1
- Children under 2 years of age: 6:1
- Children 3 years of age: 10:1

Services
- Education: Full day, simulate "middle class" mother and home and traditional nursery school
- Nutrition: Nutritional consultant
- Health: Nurse on staff, Sick Bay, pediatric consultant
- Social Services: Social worker consultant helped some of the mothers

Parent involvement: Casual contacts between parents and staff at arrival and departure of children. At end of day parents can see "Daily Care Sheet" (routines and highlights of the day). Special conferences when necessary initiated by parents or staff.

Measurement and evaluation instruments or variables:
Daily health records from nurse; physical exams regularly, randomly timed phone interviews with mothers for record on illness, accidents, and developmental milestones; Bayley Scales of Intelligence; Stanford-Binet; Uzgiris-Hunt; Vineland Social Maturity Scale; Preschool Attainment Record; structured tests of goi 3 toward a stranger and dealing with frustration; expressed (written) satisfaction or dissatisfaction of parents with the program.

Title of program: Howard University Nursery School Demonstration Project

Location of program: Washington, D. C.

Principal investigator: Ira Cisin

Administering agent: George Washington University

Dates of program initiation and termination: Services provided 1964 - 1965. Follow-up presently on-going

Characteristics of children in program
- Age range: 3 - 5 years
- Socio-economic level: low

Services
- Education: Full day, traditional nursery school curriculum
- Nutrition: Hot lunch

Parent involvement: Parents urged to observe children at the Center, serve as aides when requested, help with special projects

Measurement and evaluation instruments or variables: Stanford-Binet, Peabody Picture Vocabulary Test, Illinois Test of Psycholinguistic Abilities, Merrill Palmer test, behavioral observations during nursery school, teacher ratings, nursery school attendance records, extent of parent participation in projects, parent attendance at sponsored functions, birth weight, health status at birth

Follow-up
- Services: Special kindergarten, first and second grade educational programs. Social worker assists parents to obtain health and social services, makes home visits.
- Testing: Stanford-Binet, Peabody Picture Vocabulary Test, Goodenough Draw-a-Man Test at end of kindergarten, first and second grades. Various school achievement tests and records, second through fourth grades. Stanford-Binet and a few other tests at end of fourth grade. Parent interviews, second and third grades. Physical exam, end of fourth grade.

Title of program: Frank Porter Graham Child Development Center

Location of program: Chapel Hill, North Carolina

Principal investigator: James Gallagher

Administering agent: University of North Carolina, Chapel Hill

Dates of program initiation and termination: Fall, 1966 - on-going

Characteristics of children in program
- Age range: 6 months - 4 1/2 years
- Socio-economic level: Mixed (cross-section)
- Ethnicity: Mixed, black and white

Children-to-teacher ratio: About 4:1

Services
- Education: Full day, curriculum based on the developmental theories of Piaget and the principles of reinforcement learning
- Nutrition: Meals provided at the Center
- Health: Complete medical care at the Center and at home provided by a staff of pediatricians, dentists, and nurses. Sick children accepted at the Center. Sick children kept from close physical contact with healthy children but cared for within the cottages which house all the children.

Measurement and evaluation: No research or evaluation reports available

Future plans: Incorporation of an elementary school

Title of program: Program in Child Welfare Research

Location of program: New Haven, Connecticut

Principal investigator: Sally Provence

Administering agent: Yale University

Dates of program initiation and termination: Fall, 1967 - on-going

Characteristics of children in program
- Age range: Early infancy - 5 years
- Socio-economic level: low
- Special characteristics: First borns only

Services
- Education: Full day program, 1967 - 1971; half day nursery school, 1971 - 1973
- Health: Pediatrician provides medical attention in the clinic and home visits, nurse makes regular home visits
- Social services: Social worker makes regular home visits

Measurement and evaluation variables:
One group of children, 14 months - 4 1/2 years at admission, were studied from fall, 1967 to July, 1970.
Second group of children, oldest born December, 1968, being studied from birth on.
Measurement and evaluation for second group:
1. In-depth investigation of children on quality of personal relationships, cognitive development, motor skills, speech and non-verbal communication, methods of coping with stress, approaches to problem solving, developmental difficulties.
2. Documentation of various ways services given.
3. Detailed data on the families, including life style, child rearing, need for services, how use services.

Future plans: Group residential care program for children from infancy to 7 years of age being planned

Title of program: KLH Child Development Center, Inc.

Location of program: Cambridge, Massachusetts

Principal investigator: Kate Lafayette

Administering agent: KLH Research and Development Corporation

Dates of program initiation and termination: 1967 - on-going

Characteristics of children in program
- Age range: 2 1/2 - 6 1/2 years
- Socio-economic level: Disadvantaged background, employment at KLH brought income above poverty level.
- Ethnicity: Mixed, black, white, other
- Special characteristics: Priority to children of KLH employees

Children-to-teacher ratio: 5.5:1

Services
- Education: Full day program
- Nutrition: Breakfast, lunch, and two snacks
- Health: Services of the plant
- Social services: Supportive family services, full time social worker does counseling and referral

Parent involvement: Parents, along with others, are co-operative owners and operators of the day care center; can be on Board of Trustees of day care center; are encouraged to visit center

Measurement and evaluation variables: 1967 - 1969: interviews with parents, staff, members and officials of company; Center records. 1969: initiated systematic testing and evaluation on health, intelligence, and language development; on values, stability, and relationships within family; on attitudes and perceptions toward program by whole KLH work force; cost benefit analysis for company, parents, society.

Title of program: Milwaukee Family Rehabilitation Project

Location of program: Milwaukee, Wisconsin

Principal investigator: Rick Heber and John Rynders

Present status of program: on-going

Characteristics of children in program

Age range: Enter program before 6 months of age. Length of services indefinite. Services so far offered through preschool age.

Socio-economic level: low

Ethnicity: black

Special characteristics: Mothers have IQ of 75 or less

Children-to-teacher ratio: Children under 1 year: 1:1
Children over 1 year: 3-5:1

Services: Full day program

Measurement and evaluation instruments or variables:
Gesell Developmental Schedule, Uzgiris-Hunt, Cattell, Stanford-Binet, color-form preference, appreciation of novelty and complexity, oddity discrimination, response strategies as a function of differential reinforcement, regulatroy control of motor system, parent-child interaction, development of cognitive style, language development.